PREFACE

This manual covers installation and pre-delivery service procedures for the Honda BF75A and BF90A outboard motors.

Set-up, installation and pre-delivery service must be performed by an authorized Honda Marine Dealer. These instructions are provided for dealer use only.

FOLLOW THESE INSTRUCTIONS CAREFULLY
Proper set-up, installation and pre-delivery service are essential for safe, reliable operation. Your customer expects their Honda outboard motor to be correctly set-up, installed, adjusted, and ready for use. Test the outboard motor to be sure it is functioning properly. Fill out the HONDA MARINE Pre-Delivery Check List (#TM023) and give the yellow copy to the customer.

DO NOT OVER POWER THE BOAT
Do not install an outboard motor that exceeds the recommended maximum horsepower for the boat. Refer to the boat certification plate for the maximum recommended horsepower for the boat. For most boat applications, the motor should have a horsepower which provides 80% of the maximum recommended horsepower for the boat. If the certification plate information is not available, contact the boat manufacturer.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice.

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BF75A · BF90A OUTBOARD TYPES

It may be necessary to refer to the chart below for reference purposes.

Model	Type	Shaft Length L	Shaft Length X	Tiller Handle	Remote Control *	Power Trim/ Tilt	Tachometer	Trim Meter
BF75A	LHTA	●		●		●		●
	LRTA	●			●	●		●
	XRTA		●		●	●		●
BF90A	LHTA	●		●		●		●
	LRTA	●			●	●		●
	XRTA		●		●	●		●
	LRJA	●			●	●		●

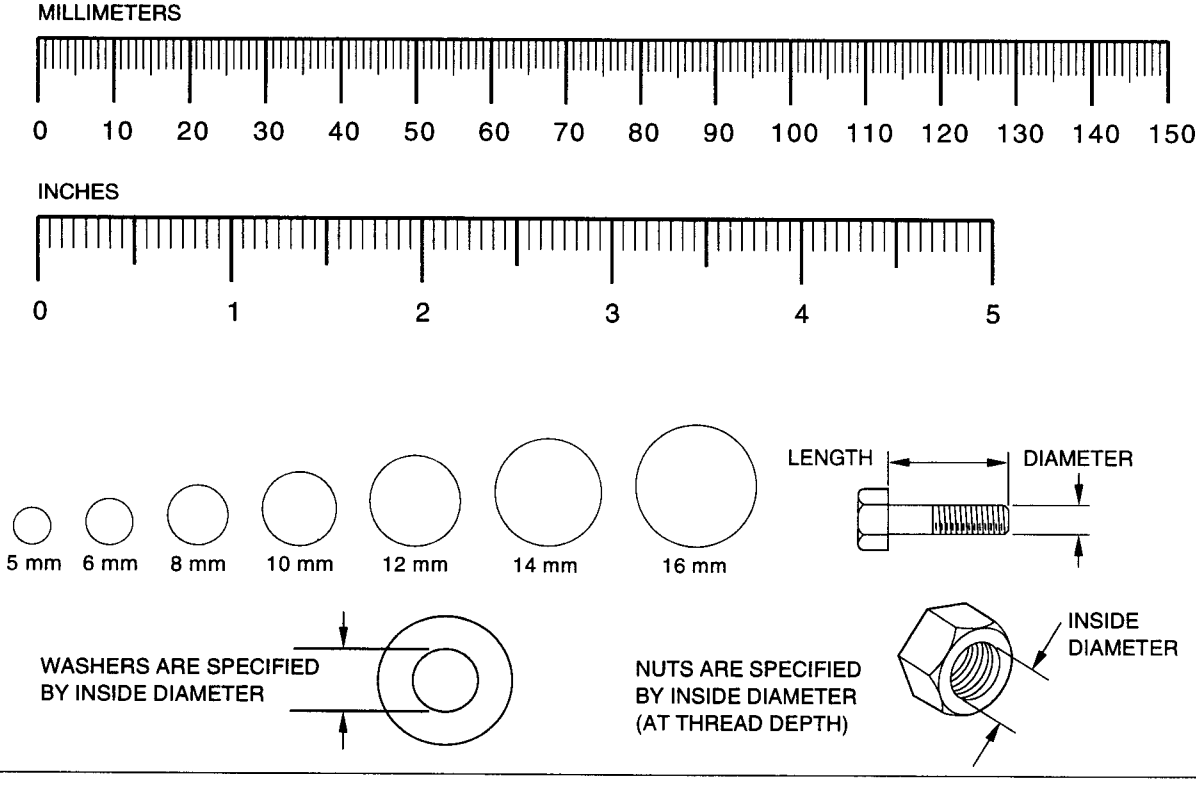
TYPE CODE (example)

L R T T = Power Trim/Tilt R = Remote Control H = Tiller Handle X = Extra Long Shaft L = Long Shaft

* Outboard motor does not come with a remote control. Remote control must be purchased separately.

HARDWARE MEASUREMENT

How to measure hardware and components:



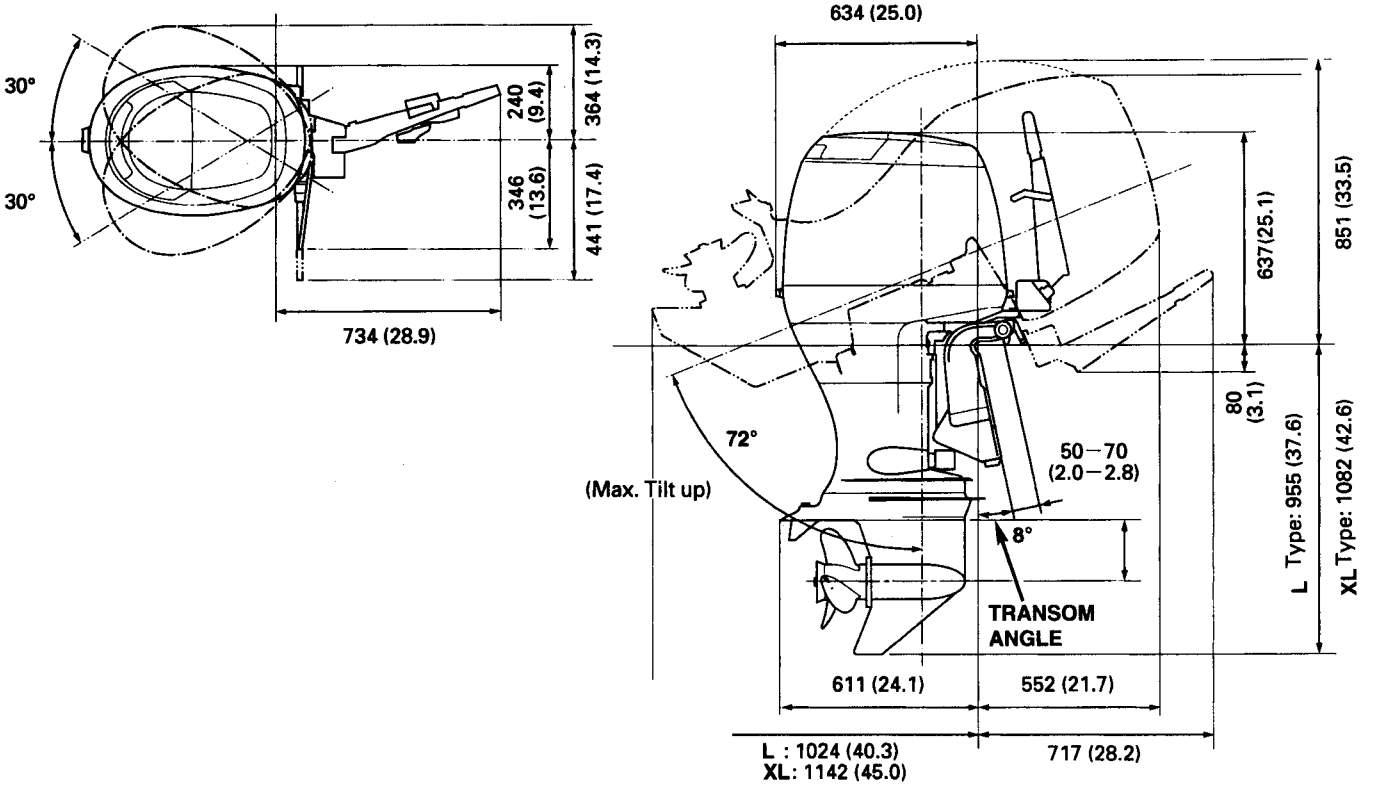
TORQUE VALUES

FASTENER APPLICATION	DESCRIPTION	TORQUE VALUES		
		ft-lb	kg-m	N·m
Propeller lock nut		55	7.6	75
Separate cover bolts	6 x 28 mm (2) 6 x 35 mm	8.7 7.2	1.2 1.0	11.8 9.8
Steering link arm bolt	3/8 in, 24 UNF	16	2.2	22
Steering plate nuts (2)	10 mm self-locking	25	3.5	34
Stern bracket mounting bolts (4)	12 x 119 mm	40	5.5	54
Tiller handle mounting bolt	8 x 32 mm	16	2.2	22
Tiller handle mounting nuts (2)	10 mm self-locking	25	3.5	34
Standard hardware	5 mm screw, bolt, nut 6 mm screw 6 mm bolt, nut 6 mm flange bolt, nut 8 mm bolt, nut 8 mm flange bolt, nut 10 mm bolt, nut	3.6 6.5 7.2 8.0 15 16 25	0.5 0.9 1.0 1.1 2.1 2.2 3.5	4.9 8.8 9.8 10.8 21 22 34

Torque values for special hardware will be called out during procedure.

DIMENSIONAL DRAWINGS

Unit: mm (in)



UNPACKING

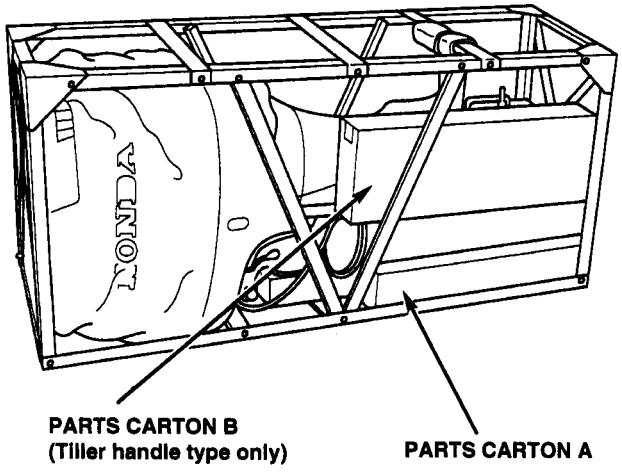
1. Cut the two bands and remove the corrugated cardboard cover.
2. Remove the parts carton(s) from the crate.

   Wear heavy gloves during unpacking to protect your hands from sharp edges and burrs on the steel crate frame.

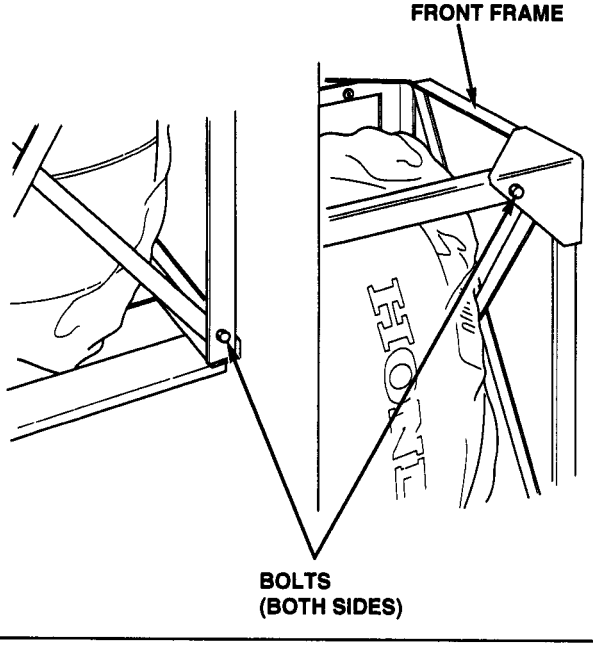
   Check parts against parts list on page 7.

   For parts lost or damaged in transit, file a transportation claim. Refer to section 13 of the Service Operations Manual.

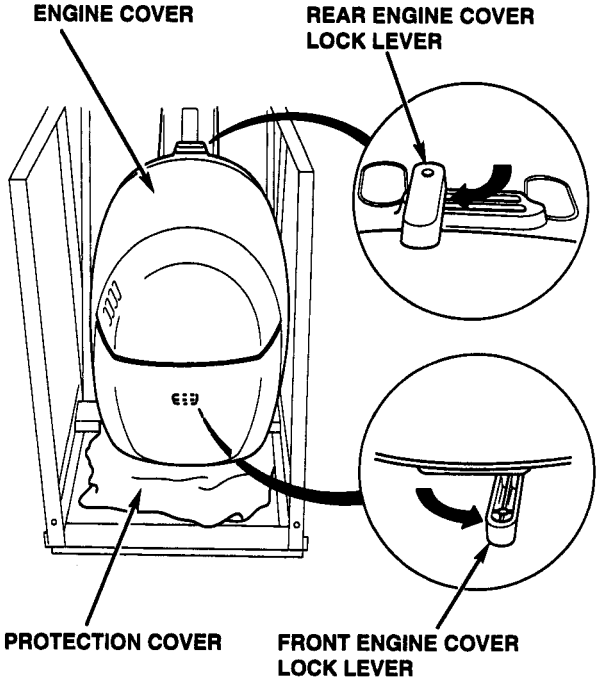
   For parts left out by the factory, file a warranty claim. Refer to section 7 of the Service Operations Manual.



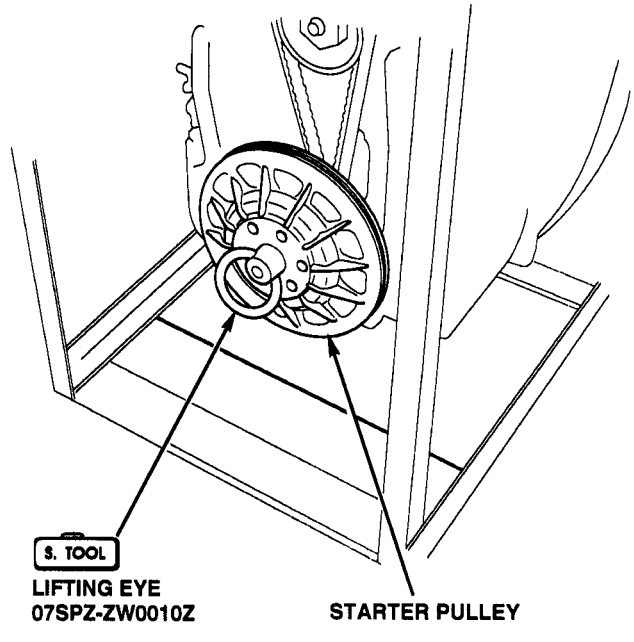
3. Remove the front and top frame bolts and frame sections.



4. Turn front engine cover lock lever to the "OPEN" position to unlock the cover.
5. Protect engine cover by placing a shop towel or equivalent material under the engine cover.
6. Turn rear engine cover lock lever to the "OPEN" position to unlock the cover. Pull off engine cover.



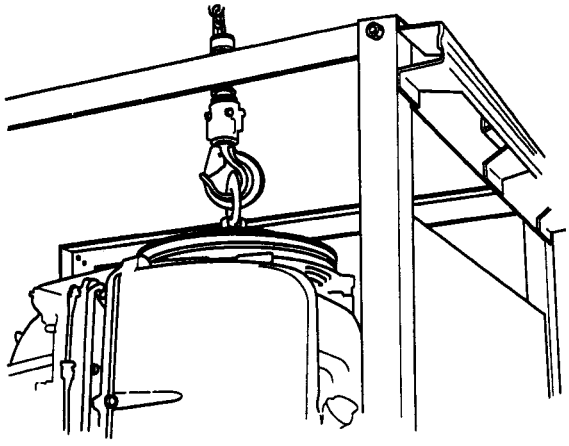
7. Screw lifting eye into starter pulley center hole by hand until lifting eye threads are not visible to the outside.



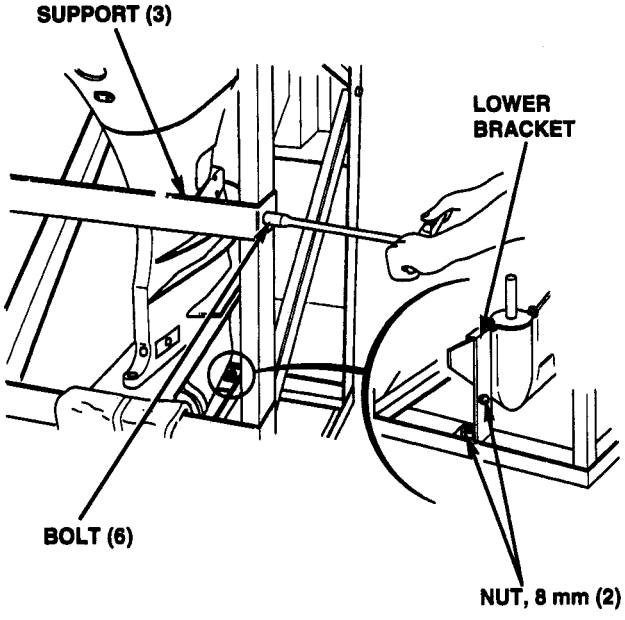
8. Connect a hoist to the lifting eye. Carefully raise outboard motor with crate frame still attached.

   Use a suitable hoist with a capacity rating of 551 lb (250 kg) or greater.

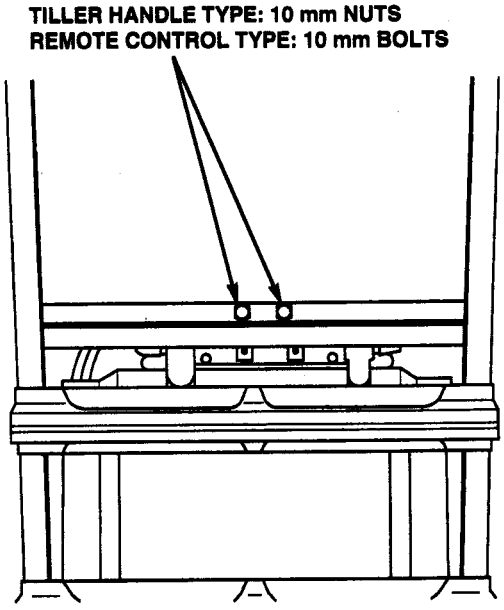
   Crate frame removal, described in the following steps, should be performed with the outboard motor and crate frame suspended above the floor.



9. Remove the six bolts, three supports, two 8 mm nuts and lower bracket supporting the gear case.

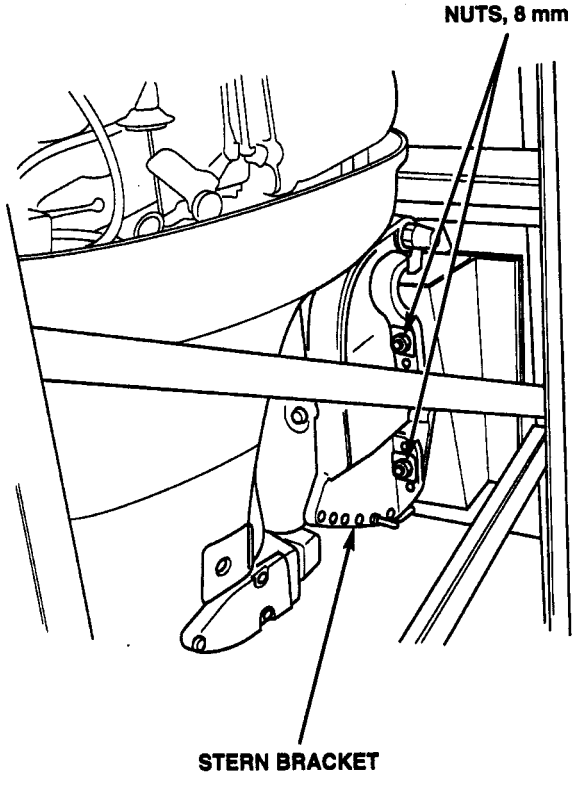


10. Remove the hardware from the steering bracket.

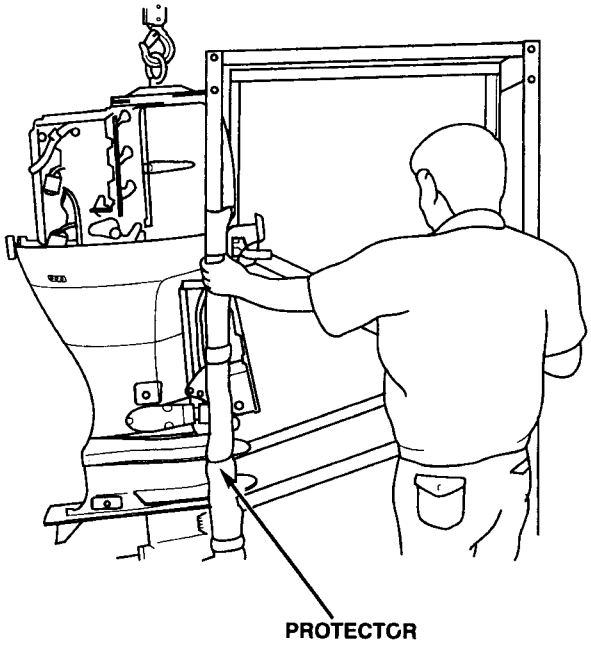


11. Remove the four 8 mm nuts from stern bracket.

    Be aware that the crate frame will drop when the nuts are removed. Be careful not to damage the outboard motor. Get an assistant to help remove the crate frame.



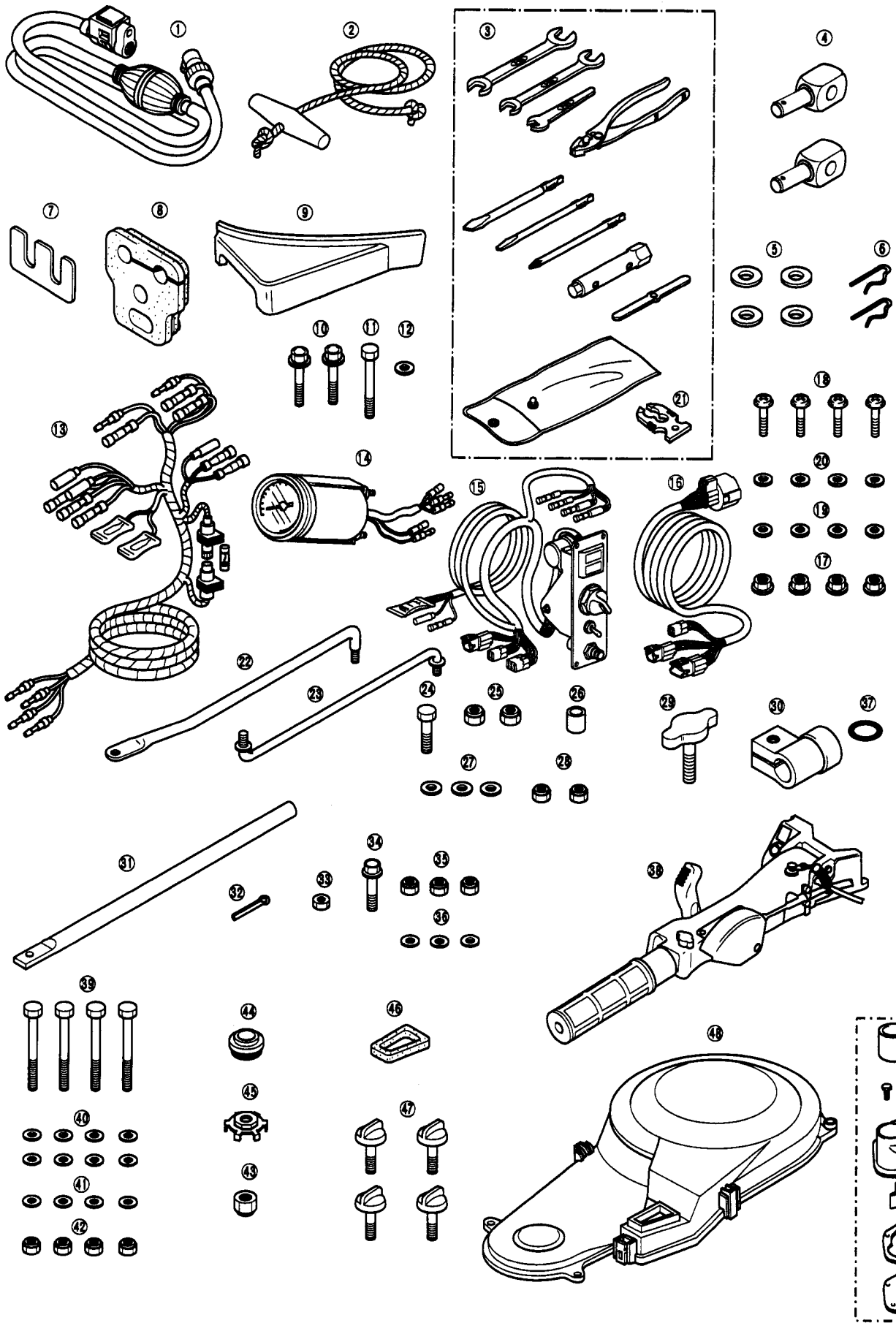
12. Protect the outboard motor by placing a suitable cover or an equivalent material between the frame and the outboard motor, and lift the outboard motor to remove it from the frame.



13. Outboard motor should be placed on stand until boat transom is completely prepared.

PARTS PACKAGE INSPECTION

Ref. No.	Part Description	BF75A			BF90A				Part Number	Honda Code	Remarks
		LHTA	LRTA	XRTA	LHTA	LRTA	XRTA	LRJA			
1	Fuel tube assembly	1	1	1	1	1	1	1	17700-ZV5-010	4729000	
2	Emergency starter rope	1	1	1	1	1	1	1	28470-816-000	0285569	
3	Tool kit	1	1	1	1	1	1	1	89000-ZW1-000	4900619	
4	Pivot shaft	2	2	2	2	2	2	2	24618-ZV5-000	3702982	
5	6 mm plain washer	4	4	4	4	4	4	4	90504-921-010	0285114	Use with Ref. No. 4
6	6 mm lock pin, large	2	2	2	2	2	2	2	90765-ZV5-000	3706595	
7	Cable lock plate	1	1	1	1	1	1	1	17877-ZW1-000	4898037	
8	Grommet	1	1	1	1	1	1	1	40105-ZW1-000	4899803	
9	Separate cover	1	1	1	1	1	1	1	40151-ZW1-000ZA	4899837	
10	6 x 28 mm bolt	2	2	2	2	2	2	2	90015-ZV0-000	1816362	Use with Ref. No. 9
11	6 x 35 mm bolt	1	1	1	1	1	1	1	90113-ZV0-000	3173382	
12	6 mm plain washer	1	1	1	1	1	1	1	90506-ZV4-000	2800605	
13	Meter wire harness A	1	1	1	1	1	1	1	32540-ZV5-910	3703873	
14	Trim meter	1	1	1	1	1	1	1	37260-ZV5-821	3704236	
15	Switch panel		1	1		1	1	1	32340-ZW1-V01	4899357	
16	Switch panel wire harness		1	1		1	1	1	32580-ZW1-V00	4899456	16.5 feet long
17	5 mm flange nut		4	4		4	4	4	94050-05020	4901419	Use with Ref. No. 15
18	5 x 40 mm screw		4	4		4	4	4	93500-05040-1B	4901393	
19	5 mm plain washer		4	4		4	4	4	94103-05200	1494962	
20	5 mm spring washer		4	4		4	4	4	94111-05400	4901427	
21	Emer. stop sw. clip (spare)		1	1		1	1	1	36187-ZV4-651	3749231	Store in tool bag
22	Steering arm		1	1		1	1	1	53238-ZW1-000	4900213	
23	Friction arm	1			1			0	53238-ZW1-700	4900221	
24	3/8-24 UNF bolt		1	1		1	1	1	90105-ZW1-000	4900775	Use with Ref. No. 22
25	3/8-24 UNF nut		2	2		2	2	2	90307-ZV5-003	3706066	
26	Collar		1	1		1	1	1	91560-ZV5-000	3706892	
27	10 mm washer	2	3	3	2	3	3	3	90514-ZV4-000	2800647	Use with Ref. No. 22, 38
28	10 mm self-lock nut	2			2				90306-ZV5-003	3706058	Use with Ref. No. 38
29	Friction bolt	1			1				53104-ZV3-000	3705050	
30	Friction block	1			1				53236-ZW1-700	4900205	
31	Friction shaft	1			1				53239-ZW1-700	4900239	
32	2.0 mm cotter pin	1			1				90759-ZV1-000	1986389	Use with Ref. No. 30
33	6 mm hex. nut	1			1				94002-06490-05	1986488	
34	8 x 32 mm flange bolt	1			1				90115-881-000	3174968	Use with Ref. No. 38
35	8 mm self-lock nut	3			3				90305-ZV4-000	2800530	
36	8 mm plain washer	4			4				90401-ZW1-000	4901104	
37	O-ring	1			1				91352-ZV5-000	4433926	Use with Ref. No. 29
38	Tiller handle assembly	1			1				Not available as an assembly		
39	12 x 119 mm hex. bolt	4	4	4	4	4	4	4	90129-ZW1-000	4900866	Outboard motor installation
40	12 mm plain washer	8	8	8	8	8	8	8	90559-ZV5-000	3706470	
41	12 mm plain washer	4	4	4	4	4	4	4	90552-ZV5-000	3706447	
42	12 mm self-lock nut	4	4	4	4	4	4	4	90308-ZW1-003	4901047	
43	Propeller nut	1	1	1	1	1	1	0	90301-ZW1-003	4856332	
44	Thrust hub	1	1	1	1	1	1	0	90506-ZW1-003	4856340	
45	Tab washer	1	1	1	1	1	1	0	90508-ZW1-003	4856357	
46	Seal rubber	1	1	1	1	1	1	1	11831-ZW1-000	4897260	Use with Ref. No. 48
47	Timing belt cover bolt	4	4	4	4	4	4	4	90003-ZW1-000	4900643	
48	Timing belt cover	1	1	1	1	1	1	1	11821-ZW1-000	4897252	
49	Water pump assembly							1	Not available as an assembly		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MOTOR INSTALLATION

Motor Selection

Secure and correct installation is essential for safe boating and good perfomance. Follow the installation instructions provided in this manual.

⚠ WARNING

Improper set-up or pre-delivery service can cause an unsafe condition that can cause your customer to be seriously hurt or killed.

Follow the procedures and precautions in this manual and the shop manual carefully.

Before installation, check to be sure that the outboard motor does not exceed the recommended maximum horsepower for the boat on which it is to be installed. Refer to the boat's certification plate for recommended maximum horsepower. For most applications, the outboard motor should provide 80% of the recommended maximum horsepower for the boat. If the certification plate information is not available, contact the boat dealer or manufacturer.

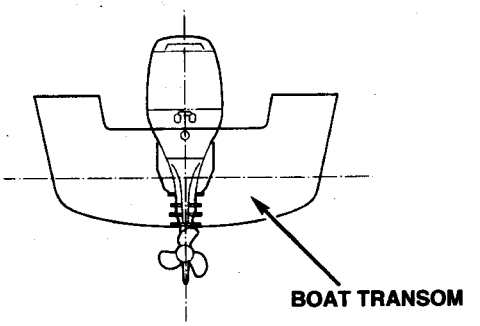
Refer to the dimensional drawings on page 3 to be sure there is nothing on the boat that will interfere with outboard motor tiltup and steering.

The BF75A and BF90A outboard motors are designed to be installed on boat transoms with the following transom board thickness.

Boat Transom Board Thickness
2 ~ 2-3/4 inch (50 ~ 70 mm)

General Guidelines

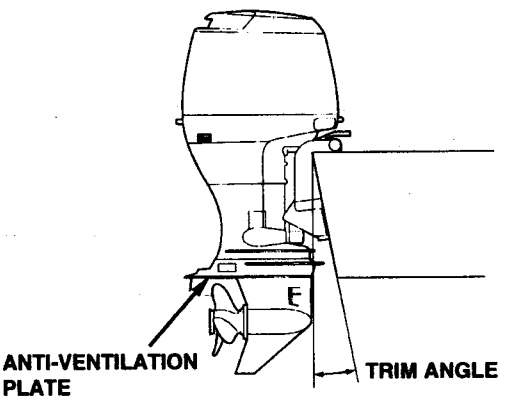
Install the outboard on the center of the transom securely and be sure that the boat is well-balanced.



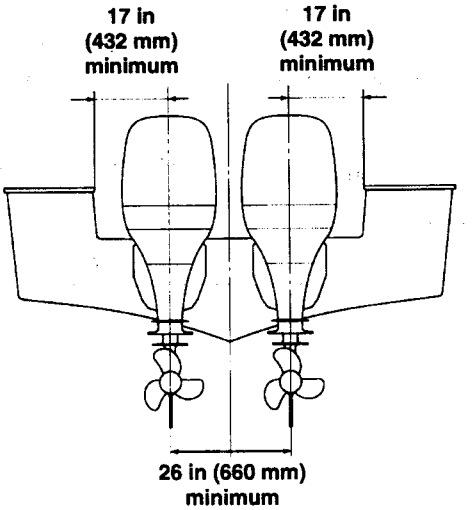
As a general rule, the outboard should be installed so the anti-ventilation plate is parallel to the boat bottom.

If the boat transom angle is less than 8°, the BF75A or BF90A anti-ventilation plate will not be parallel to the boat bottom when trimmed to the lowest hole.

Refer to your boat specifications for details.



Dual outboards must be installed so that the outboard center-to-center distance is a minimum of 26 inches (660 mm). The transom board should still have a minimum extra space of 17 inches (432 mm).
The right and left outboards must be well-balanced.

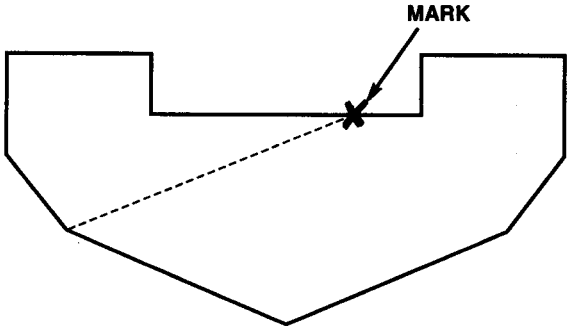


Boat Transom Center Line

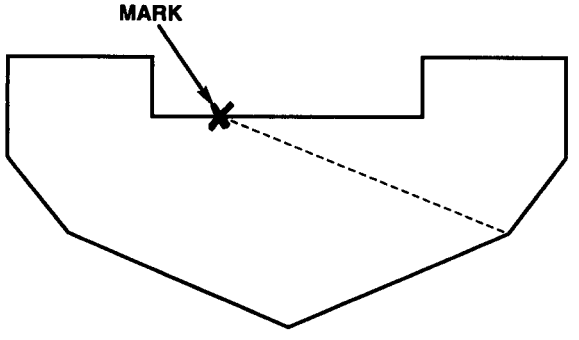
Measure across the transom to determine the transom center line and draw a vertical line. On a "V" bottom boat, the vertical line should pass through the keel.

Use a pencil and tape measure to locate center line.

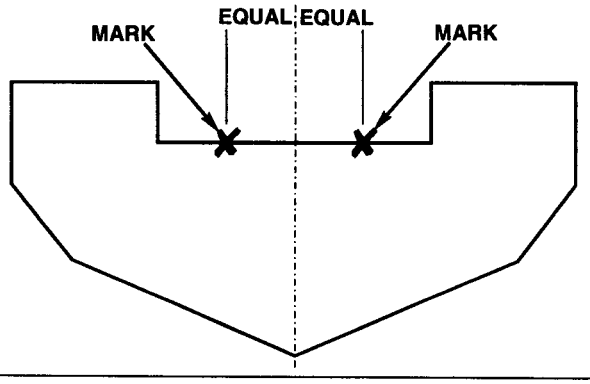
1. Put one end of the tape measure on a chine and place the other end on the upper edge of the transom, somewhere past the "visual" center. Place a mark on the transom and record the distance measured.



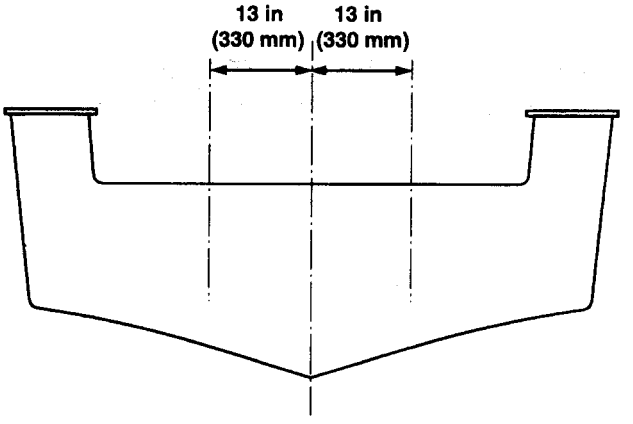
2. Measure the same distance from the opposite chine and make a mark.



3. Measure the distance between the two marks and place a third mark halfway between them. The line connecting the third mark with the keel is the center line.



If dual outboards are to be installed, mark transom at a minimum of 13 inches (330 mm) from center line.



Installation Height Check

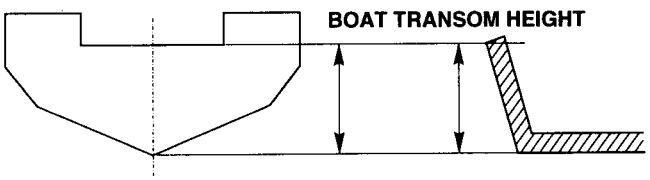
Optimum outboard motor installation height varies with boat type and bottom shape. Normal installation height recommendations are shown on page 12. Contact the boat manufacturer for any special recommendations that are unique to a specific model of boat.

If the outboard motor is installed to low:
– The boat will squat and be hard to plane.
– The boat will tend to porpoise.
– The boat high-speed stability will be reduced.

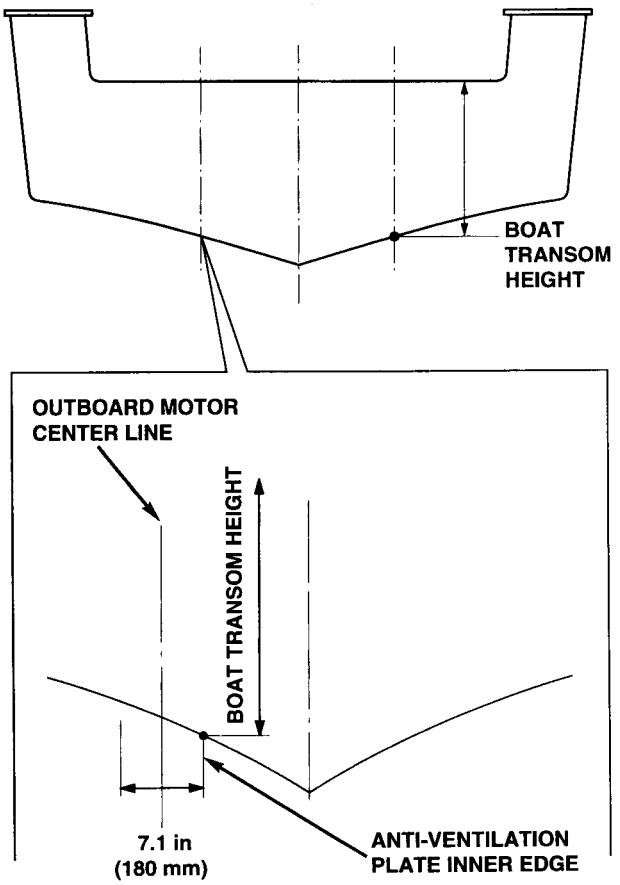
If the outboard motor is installed too high, ventilation may occur.

1. Measure the boat transom height.

SINGLE OUTBOARD



DUAL OUTBOARDS

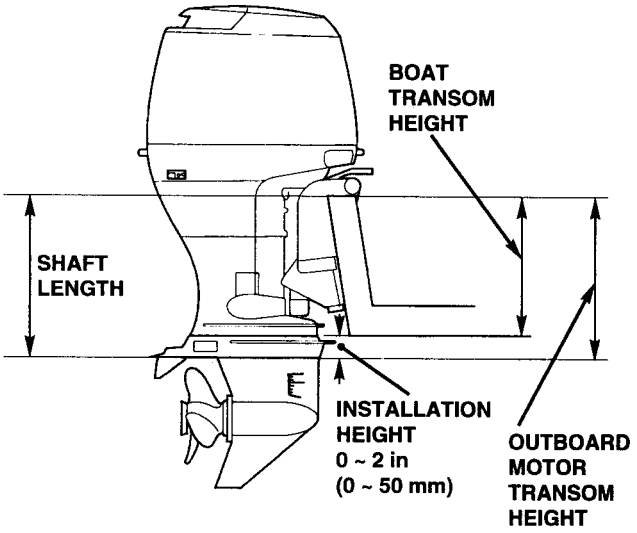


On "V" bottom boats, measure the transom height. It should be the distance from the top edge of the boat transom to the point at which the vertical line passing the inner edge of the anti-ventilation plate intersects with the boat bottom.

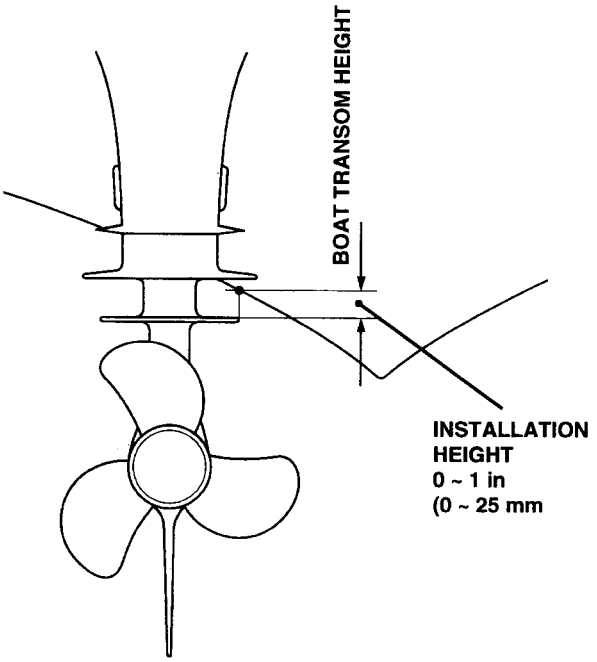
2. Calculate the outboard shaft length requirement. Match the appropiate outboard shaft length to your boat transom height.

Shaft Length	Outboard Transom Height	Workable Boat Transom Height
Long	21-1/8 in (537 mm)	19-3/16 ~ 21-1/8 in (487 ~ 537 mm)
Extra long	26-1/8 in (664 mm)	24-3/16 ~ 26-1/8 in (614 ~ 664 mm)

To determine outboard shaft length requirement, subtract the boat transom height and the motor transom height. The difference should be approximately 0 ~ 2 in (0 ~ 50 mm) which is the installation height range.



When mounting dual engines on "V" bottom boats, the outboard installation height range is 0 ~ 1 in (0 ~ 25 mm).



3. If the outboard installation height cannot be achieved, adjust boat transom height.

Boat Transom Height Adjustment

If the transom is too low or too high, or needs to be modified to accommodate the width of the outboard motor(s), contact the boat's manufacturer and follow their recommendations for corrective action.

If mounting two outboard motors, be sure the installation height is identical for both.

Some boat manufacturer's may require different mounting heights. Consult your boat manufacturer for specifics on your boat.

Transom Drilling

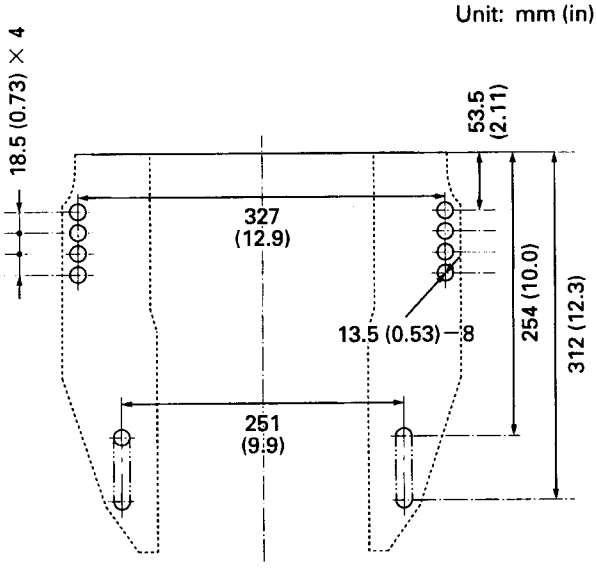
Verify that no damage will occur when the motor mounting holes are drilled. Look for any structural impediments such as bulkheads, braces, fuel cells, bilge pumps, or floor sections before drilling.

Ensure that there is adequate space for the bolt and washer to bear on a flat surface.

Use the TRANSOM MOUNT DRILL FIXTURE (special tool P/N 07MPZ-ZV3010B) as a drill guide. Wear safety glasses and drill four 1/2-inch holes in the transom. Drill upper holes at least 1 inch (25 mm) below transom top edge.

Use a vacuum cleaner to clean up after drilling.

Unit: mm (in)

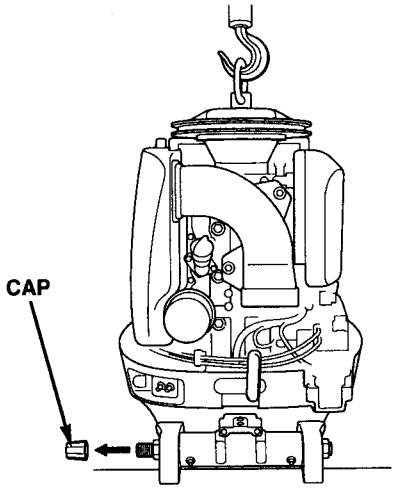


Steering Cable Installation (remote control type)

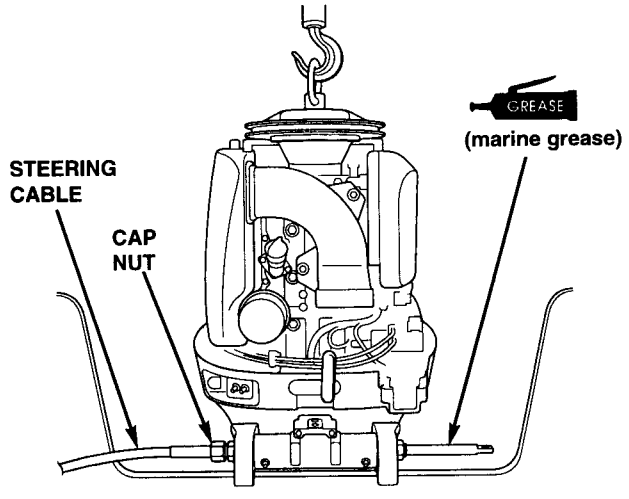
Do this before final placement of the motor on the transom.

Refer to the steering cable manufacturer's manual for cable handling procedures.

1. Remove the cap from the steering/tilt tube.



2. Fully extend steering cable. Apply marine grease to the inner and outer cable ends. Do not use wheel bearing grease. Install steering cable through steering/tilt tube.
   When steering cable enters from the port side, the steering/tilt tube must be reversed. Refer to the shop manual for proceedures.
3. Hand-tighten steering cable cap nut at this time.

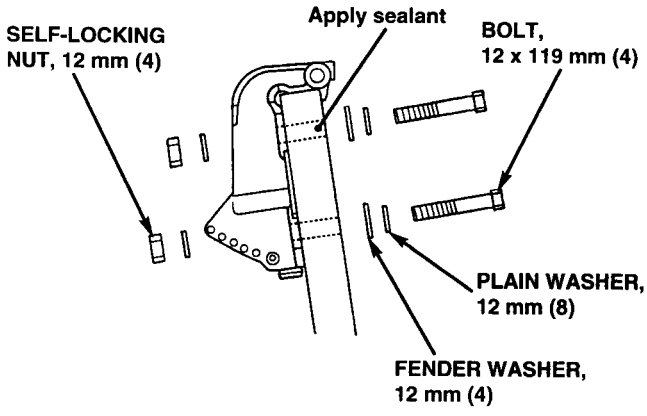


4. Lower motor on transom and align mounting holes.

Bolting Motor to Transom

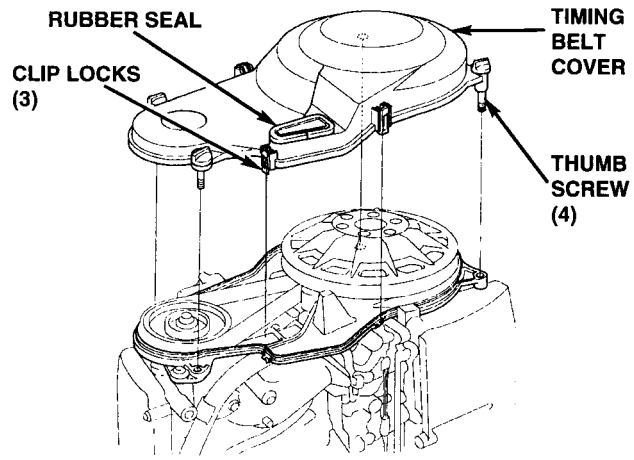
With motor resting on the boat transom, verify correct motor height. Motor can be raised by using a lower set of mounting holes. Apply silicone sealant or equivalent to the mounting bolt holes. Secure motor by installing bolts from the boat side. Tighten the self-locking nuts. The bolts must have sufficient thread length to tighten down and have at least two or three threads past the end of the self-locking nut.

TORQUE: Mounting bolt: 40 ft-lb (54 N·m)



Timing Belt Cover Installation

1. Remove the hoist and lifting eye.
2. Attach the rubber seal to the timing belt cover.
   - Use Honda Weatherstrip Cement or equivalent to attach rubber seal.
     Honda Weatherstrip Cement:
     P/N 08712-0002 H/C 2963882
   - Install rubber seal so the rubber seal joint ends do not interfere with the corners.
3. Install timing belt cover. Tighten four thumb screws and snap three clip locks.

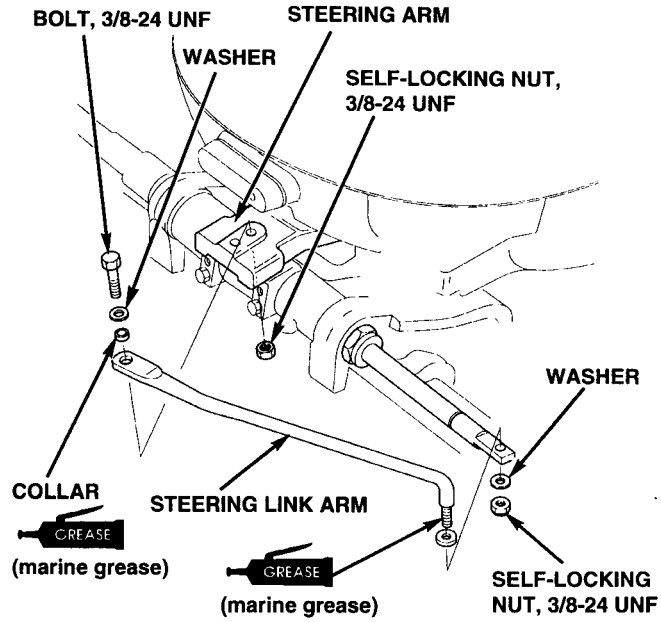


Steering Link Arm Installation (remote control type)

The steering link arm must be secured between the steering plate and steering cable, using the bolt, washers, nuts, and collar shown below. Both the bolt and self-locking nuts, used at each end of the steering link arm, must be in good condition. Install and tighten hardware as follows:

1. Install bolt, washer, and collar into link arm. Thread bolt into steering arm inside hole. Tighten bolt then tighten lock nut. Do not use forward hole.

   TORQUE:
   3/8-24 UNF bolt: 16 ft-lb (22 N·m)
   3/8-24 UNF lock nut: 13 ft-lb (18 N·m)
2. Turn steering wheel to extend the steering cable out of the steering/tilt tube. Install steering link arm into steering cable end. Use hardware shown below and connect link arm to the steering cable.
3. Turn steering wheel to retract steering cable into the steering/tilt tube. Tighten steering link arm to steering cable self-locking nut to a torque of 7~8 ft-lb (8~11 N·m) then loosen self-locking nut 1/8 turn.



4. Tighten steering cable nut until the steering cable end play is removed.

   TORQUE:
   Steering cable nut: 25 ~ 36 ft-lb (34 ~ 49 N·m)

   After steering cable nut is torqued, there should be no end play between outer steering cable and steering/tilt tube.

   For further information regarding steering cable, refer to boat manufacturer's operation manual.

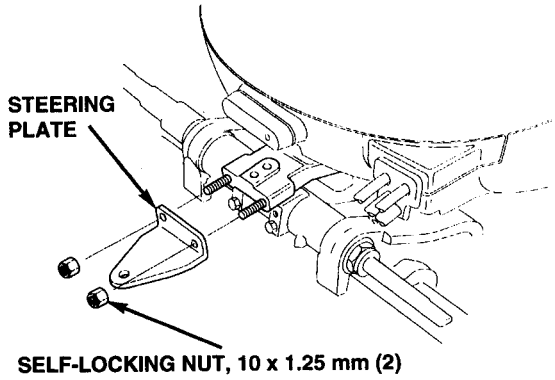
5. Directly after completing the steering link arm and steering cable installation, verify the following:
   - Motor turns the proper direction when the steering wheel is turned right and left. If the steering is reversed, correct at the steering box.
   - Motor steering angle is equal when steering wheel is turned full right and full left. If the motor steering angles are not equal:
     – Major corrections can be made at the steering box (refer to the steering box or steering cable manufacturer's instructions).
     – Minor corrections can be made by moving the steering/tilt tube laterally (refer to the Shop Manual).

   Make the steering angles equal as necessary.
   - The steering cable and/or steering link arm must not come in contact with any part of the boat when the steering wheel is turned full right and full left and at all tilt angles. Correct as necessary and check again.

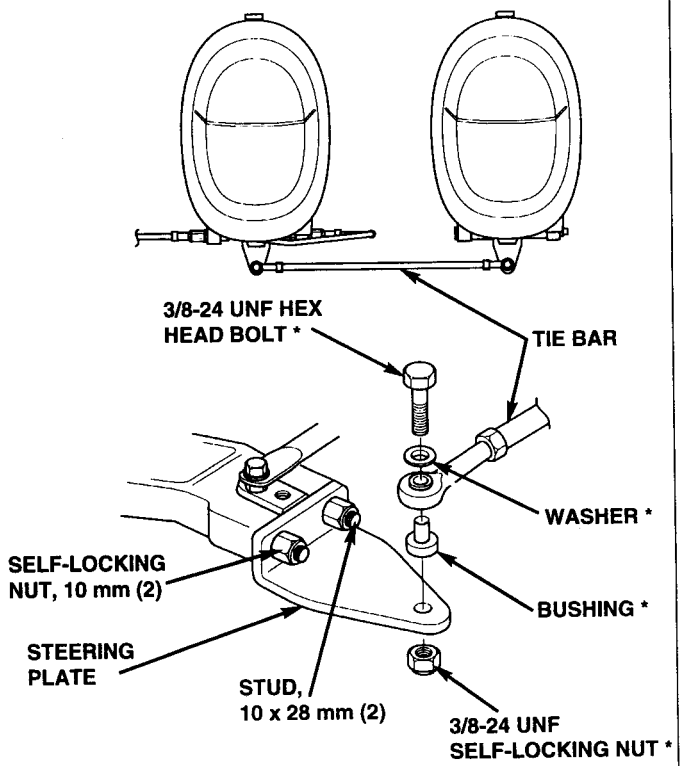
Tie Bar Installation (dual motors)

1. As previously described, install steering cable and steering link arm.
2. Install a steering plate on each motor.

   TORQUE:
   Self-locking nut, 10 x 1.25 mm: 25 ft-lb (34 N•m)



3. Install a Honda or commercially available tie bar in the steering plate hole.

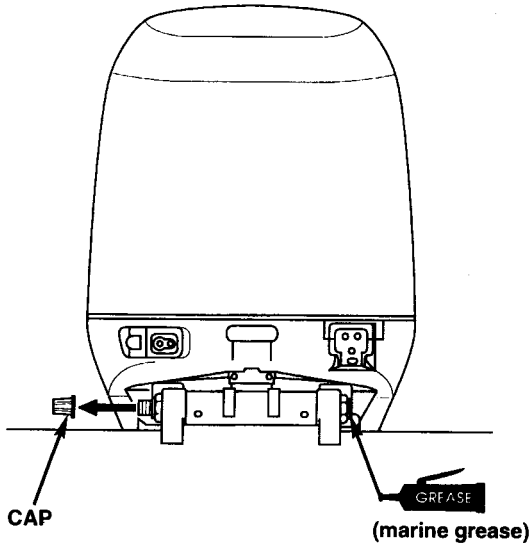


Part Description	Part Number
Tie Bar	50850-ZV5-000AH
Steering plate	53234-ZW1-000
Self-locking nut, 10 mm	90306-ZV5-003
Stud, 10 x 28 mm	90109-ZV5-000

* Included with tie bar.

Tiller Handle Assembly Installation

1. Remove right side cap from tilt tube.

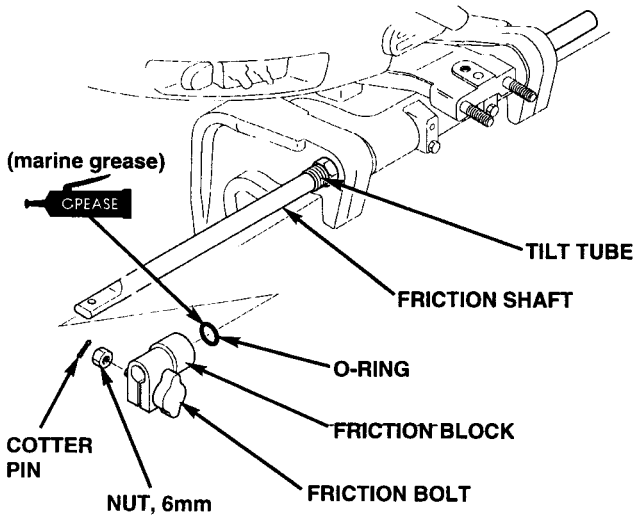


2. Apply marine grease to the friction shaft and install friction shaft into tilt tube.

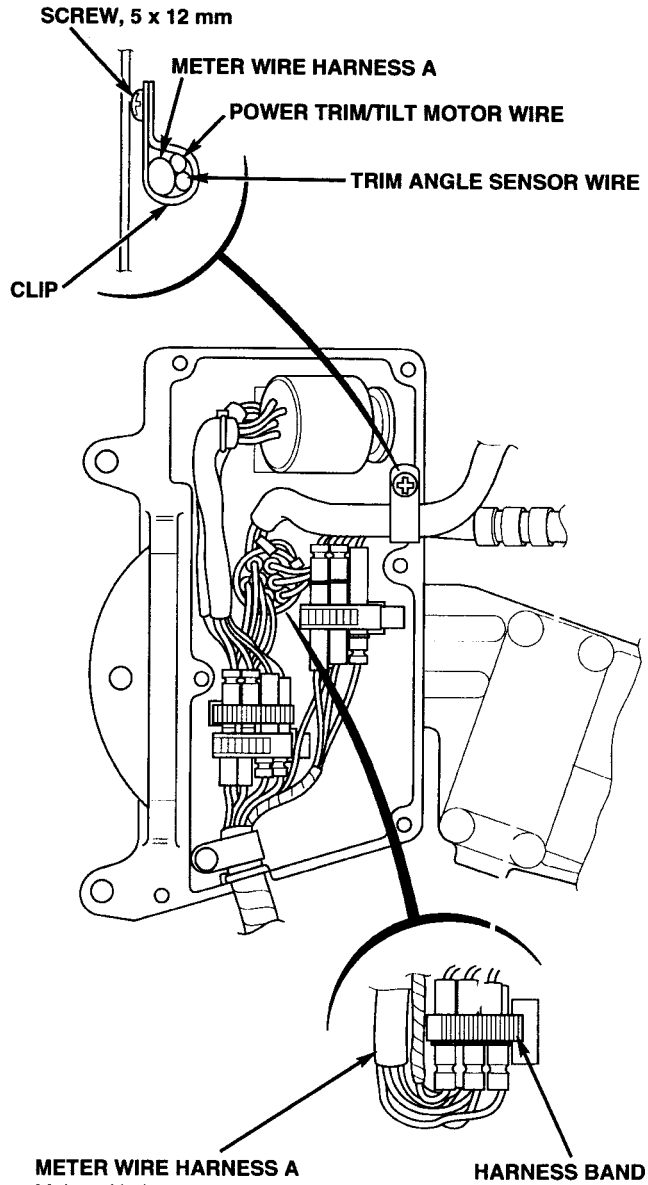
   Apply marine grease to O-ring then install O-ring into friction block.

   Install friction block over friction shaft and onto tilt tube.

   Install the friction bolt, 6 mm nut, and cotter pin on the friction block.



3. Connect Meter Wire Harness A to the tiller handle wire harness.
   - Remove tiller handle cover, and connect Meter Wire Harness A to tiller handle harness.
   - Connect harnesses as shown, and secure with harness bands and harness clips.
   - If a remote power trim/tilt foot switch is to be installed, do it now. Refer to page 21.

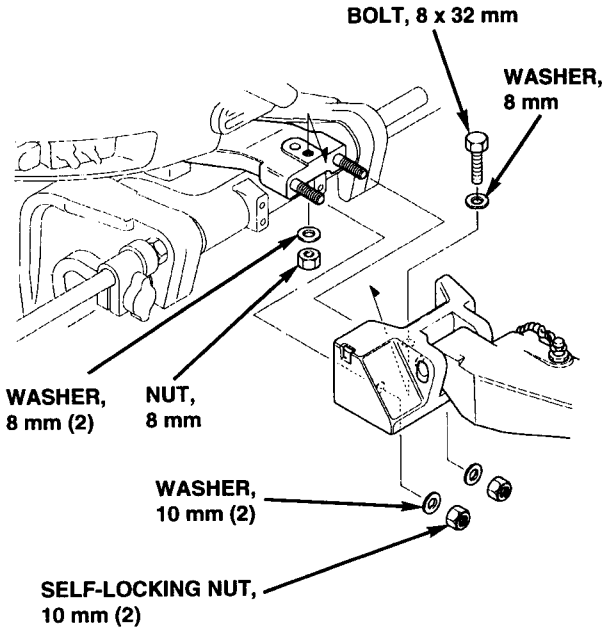

SCREW, 5 x 12 mm
METER WIRE HARNESS A
POWER TRIM/TILT MOTOR WIRE
TRIM ANGLE SENSOR WIRE
CLIP
METER WIRE HARNESS A
Make a U-shape turn as shown.
HARNESS BAND
After connecting the connectors, clamp them with the harness band as shown.

Part Description	Part Number
Screw, 5 x 12 mm	90123-ZV3-000
Clip	90602-SB0-003
Harness band	32161-404-000

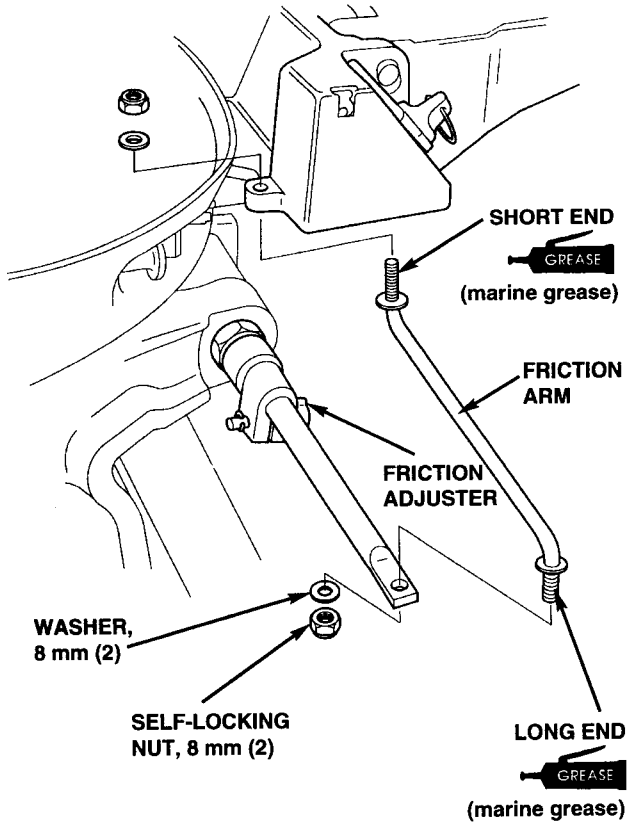
4. Install tiller handle assembly and loosely secure with 10 mm washers and self-locking nuts. Then install 8 mm bolt and washer. Tighten 10 mm nuts and 8 mm bolt to specified torque. Then tighten 8 mm nut.

TORQUE:

Self-locking nut, 10 mm:	25 ft-lb (34 N·m)
Bolt, 8 mm:	16 ft-lb (22 N·m)
Nut, 8 mm:	16 ft-lb (22 N·m)



5. Install the steering friction arm between the tiller handle bracket and the friction shaft. Secure with the 8 mm washers and 8 mm self-locking nuts. Tighten 8 mm self-locking nuts to a torque of 7 ~ 8 ft-lb (8 ~ 11 N·m), then loosen self-locking nuts 1/8 turn. Threads must protrude past the end of the self-locking nuts.



6. Adjust steering friction by turning friction adjuster.

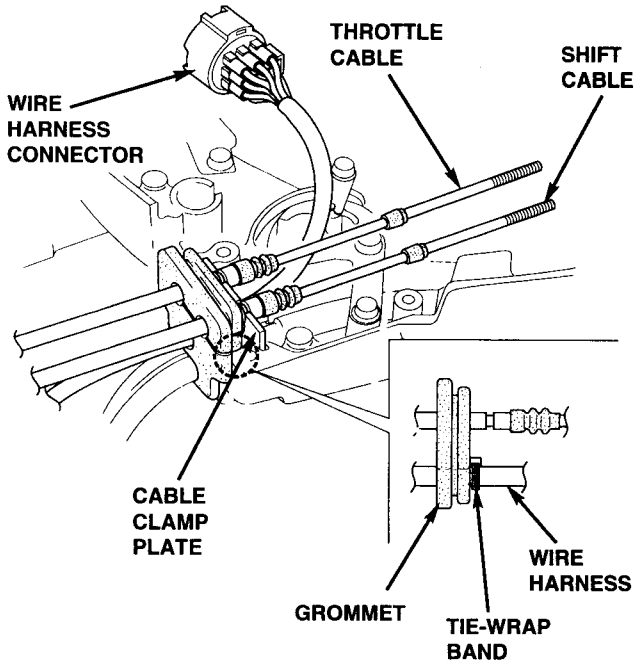
Cable/Electrical Connections (motor side)

Remote Control Types: route and connect cables to remote control before connecting them to the motor.

1. Pass wire harness and control cables through grommet.

   Hold control cables with cable clamp plate by aligning the plate cutout with cable groove.

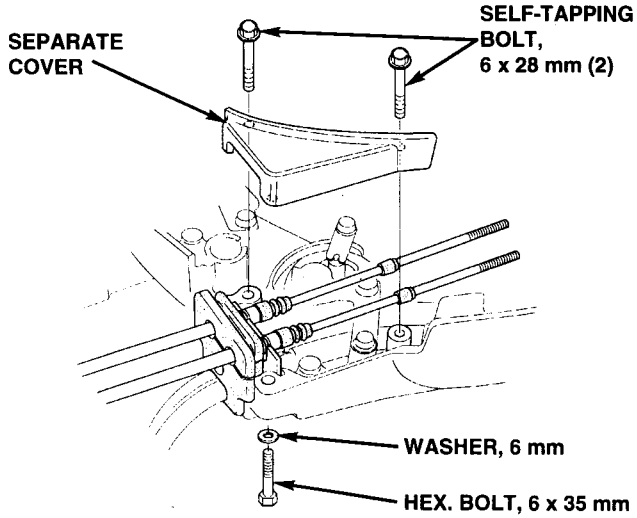
   Position tie-wrap band on wire harness inside grommet as shown.



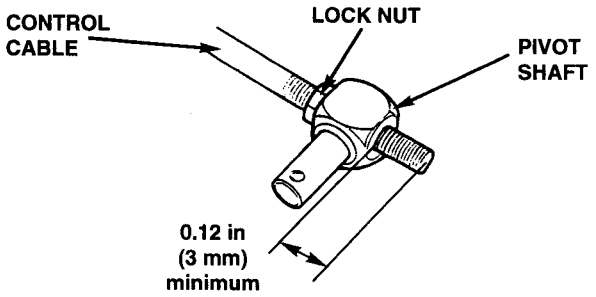
2. Install separate cover and tighten bolts securely.

   TORQUE:

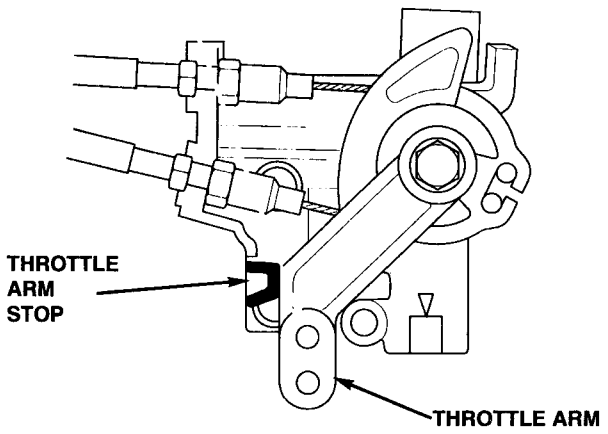
Self-tapping bolt, 6 x 28 mm:	9 ft-lb (12 N•m)
Hex. bolt, 6 x 35 mm:	7 ft-lb (10 N•m)



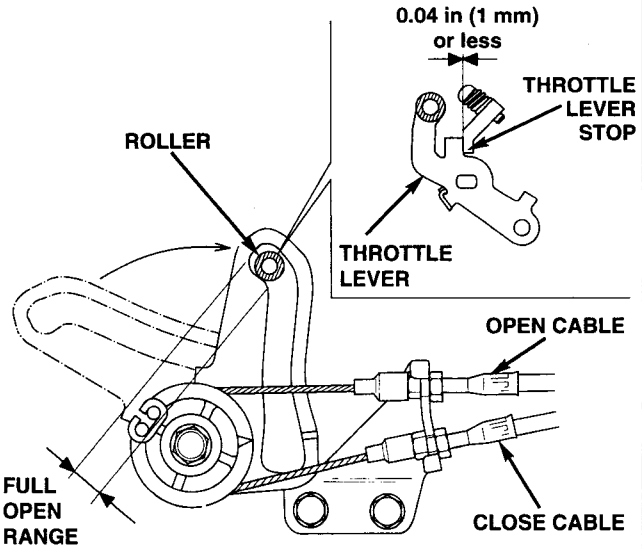
3. Thread pivot shaft onto threaded portion of the throttle and shift cable as shown.
4. Do not tighten lock nuts at this time. The lock nuts will be tightened after cables are connected.



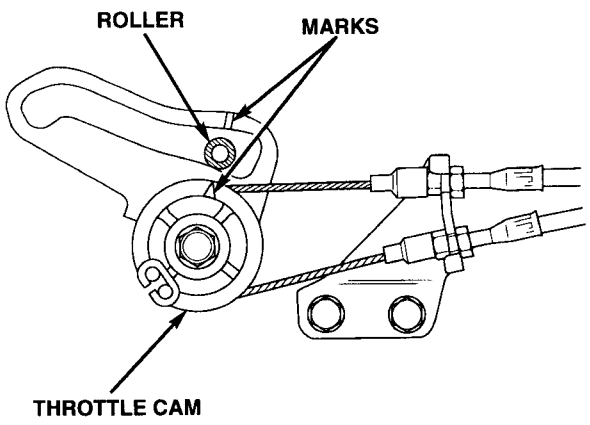
5. Pull and hold throttle arm against throttle arm stop.



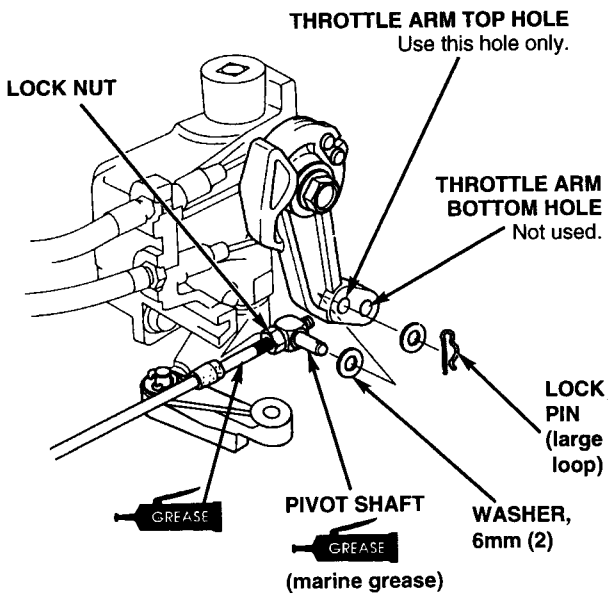
Check clearance between carburetor throttle lever and throttle lever stop. Wide open throttle (WOT) clearance should be 0.04 in (1 mm) or less. If adjustment is necessary, refer to shop manual for open and close cable adjustment. If clearance is within specifications, release throttle arm and proceed to step 6.



6. Throttle Cable Connection:
Apply marine grease to throttle cable pivot shaft.
Rotate the throttle cam until marks bisect roller.



Adjust pivot shaft until it will easily attach to the throttle arm top hole. **Install pivot shaft from the engine side.** Be sure pivot shaft, washers, and lock pin are installed as shown.

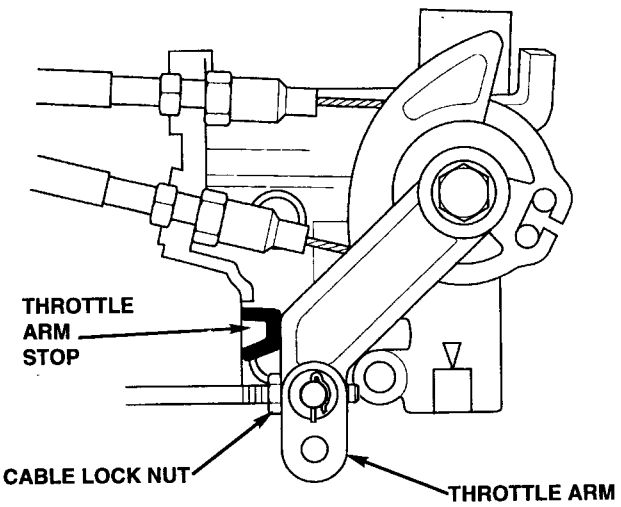


After connecting pivot shaft, go back and make sure marks still bisect roller. If marks do not bisect roller, readjust pivot shaft.

IMPORTANT

Top Mount Remote Controls:
Move remote control lever to full throttle position. Make sure throttle arm contacts throttle arm stop.

COMMANDER 3000 ONLY – If throttle arm does not contact throttle arm stop or control lever hits dash panel, raise remote control with spacer as needed for additional control lever travel. This will allow the throttle arm to contact throttle arm stop.

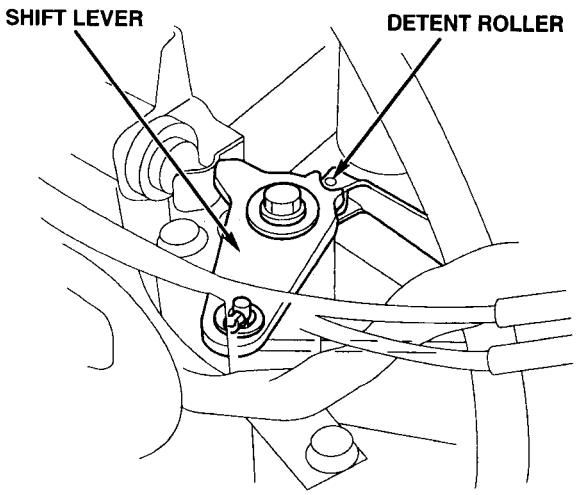


Part Description	Part Number
Spacer, single top mount	90441-ZW1-000AH
Spacer, dual top mount	90442-ZW1-000AH

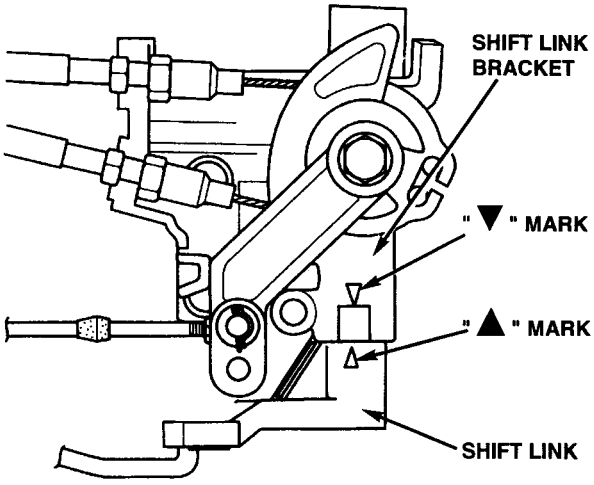
After making sure throttle arm contacts throttle arm stop, tighten cable lock nut and proceed.

Avoid changing the open or close throttle cable adjustment. These cables normally do not require adjustment during pre-delivery service. If these cables are changed unnecessarily, full throttle and/or idle speed may be adversely affected. If you cannot achieve full throttle or proper idle speed, always check control cable adjustment first before changing the open or close cable adjustment.

1. Shift Cable Connection:
   Make sure the shift lever is in the neutral position.

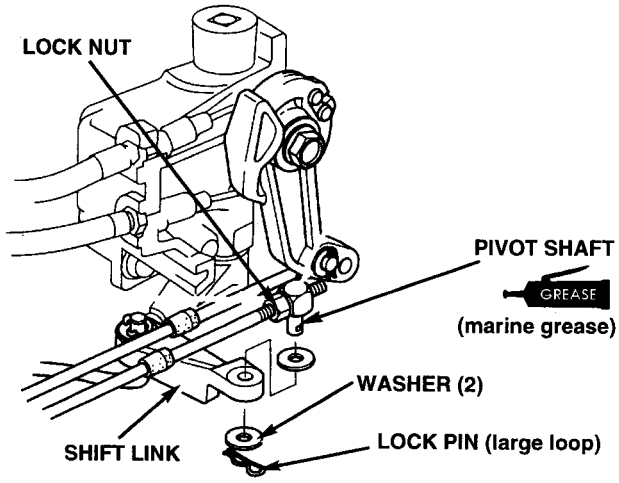


The " ▼ " mark on the shift link bracket will be aligned with the " ▲ " mark on the shift link.



2. Grease pivot shaft with marine grease.

Adjust pivot shaft until it will insert into shift link. Preload shift cable by turning pivot shaft one turn away from lock nut. Be sure pivot shaft, washers, and lock pin are installed as shown.



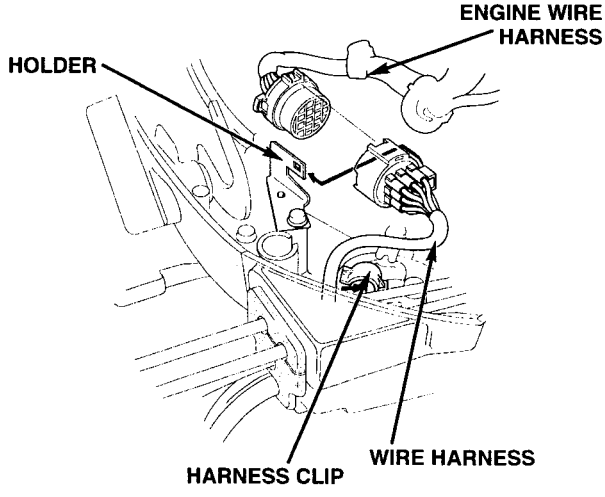
After attaching shift cable to shift link, check for smooth operation by moving remote control or gear shift lever to foward and reverse positions. Make sure shift link moves smoothly and returns to the neutral detent position when the remote control or gearshift lever is returned to neutral.

NOTICE

If it is hard to shift, turn propeller shaft. Shifting with force will damage shift mechanism.

If shift arm moves smoothly and neutral detent aligns, tighten cable lock nut and proceed.

3. Connect wire harness to the engine wire harness and attach harness connector to holder. Secure wire harness with harness clip.



4. Operate control lever or gear shift lever to check for smooth, proper shift cable and throttle cable operation.

POWER TRIM/TILT FOOT SWITCH (tiller handle type)

When mounting a tiller handle type outboard, an optional power trim/tilt foot switch can be installed. It will be necessary to perform wiring connections.

Connect the terminals and terminal covers to the wire harness that comes from the power trim/tilt foot switch.

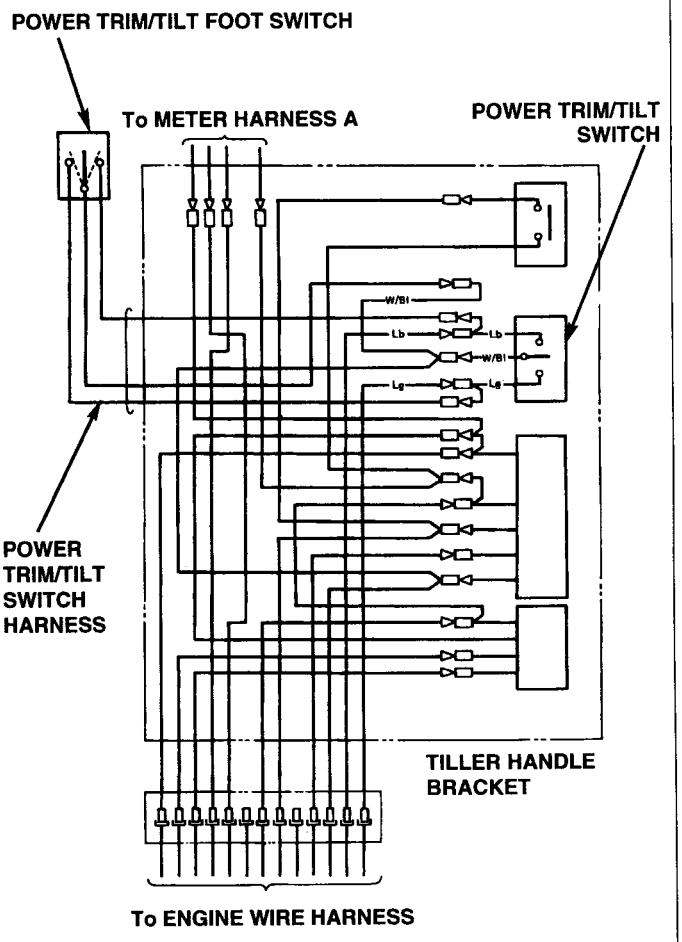
Be sure to use water resistant terminal covers.

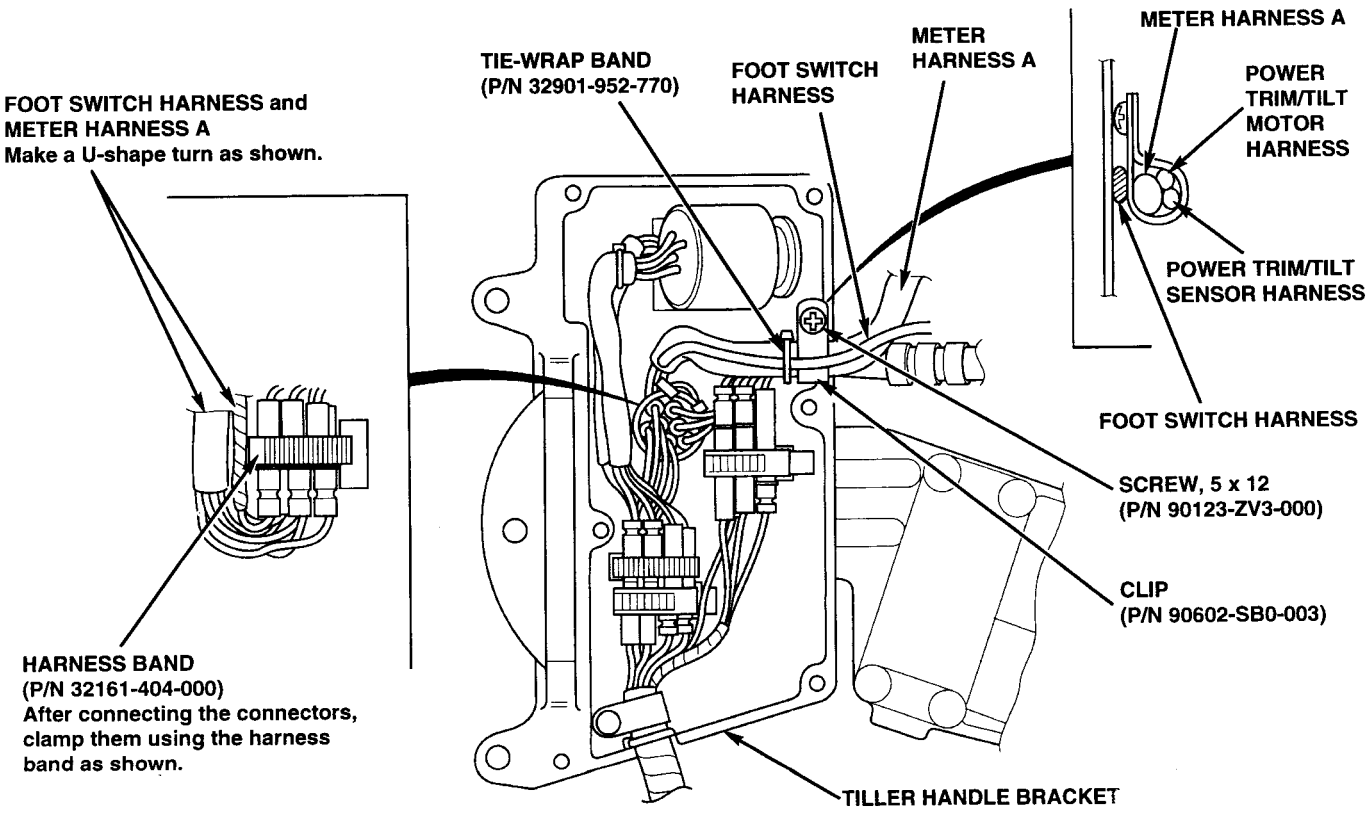
If terminals are added, always use a wire crimper and securely stake terminals to wires.

Remove the tiller handle bracket cover, connect the power trim/tilt foot switch wire harness, and secure it with the harness band and clips.

Foot Trim Switch: P/N 06180-ZV5-000AH
H/C 5385976

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	l g	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY
Sl	SLATE	Pu	PURPLE




FOOT SWITCH HARNESS and METER HARNESS A Make a U-shape turn as shown.
TIE-WRAP BAND (P/N 32901-952-770)
FOOT SWITCH HARNESS
METER HARNESS A
METER HARNESS A
POWER TRIM/TILT MOTOR HARNESS
POWER TRIM/TILT SENSOR HARNESS
FOOT SWITCH HARNESS
SCREW, 5 x 12 (P/N 90123-ZV3-000)
CLIP (P/N 90602-SB0-003)
HARNESS BAND (P/N 32161-404-000) After connecting the connectors, clamp them using the harness band as shown.
TILLER HANDLE BRACKET

METERS INSTALLATION

Meters and other instruments should be installed on the instrument/mounting panel. If any other location is selected, it will be necessary to use a mounting plate with a thickness of 1/16 ~ 7/16 in (2 ~ 11 mm).

If mounting plate thickness exceeds 0.44 in (11 mm), the mounting bracket must be modified accordingly.

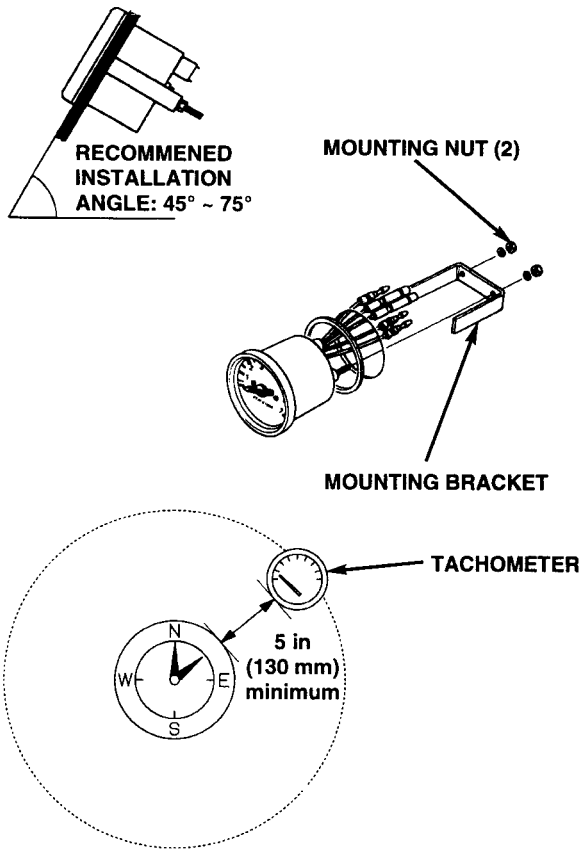
Tighten the mounting nuts evenly on both sides.

Meter installation angle should be within 45° to 75°.

If boat has a magnetic compass, install tachometer a minimum of 5 in (130 mm) away from compass.

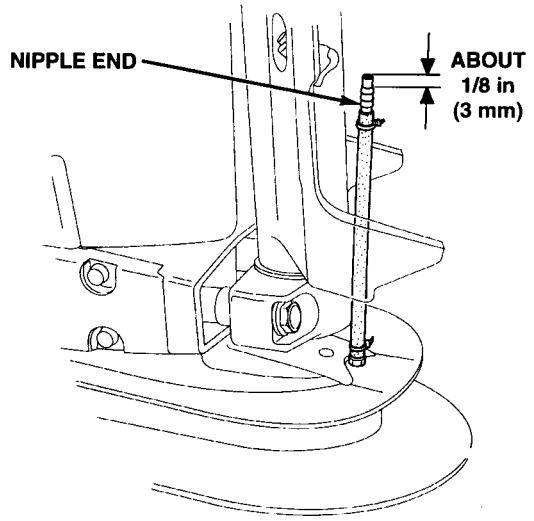
Meter	Part Number	Hole Saw Size
Tachometer*	37250-ZV5-950AH	3 3/8" (86 mm)
Trim Meter	37260-ZV5-821	2 1/8" (54 mm)
Speedmeter 10-65 mph	06372-ZV5-910	3 3/8" (86 mm)
Speedmeter 5-35 mph	06372-ZV5-950AH	3 3/8" (86 mm)
Hour Meter	39700-ZV5-912	2 1/8" (54 mm)
Hour Meter	39700-ZV5-800AH	2 1/16" (52 mm)
Voltmeter	37450-ZV5-911	2 1/8" (54 mm)

* Set selector switch to 4 pole alternator position.



Speedometer Tube Installation

Cut off about 1/8 in (3 mm) of the nipple end of the outboard motor sensor, then insert it into the speedometer tube. Attach securely with a clamp.



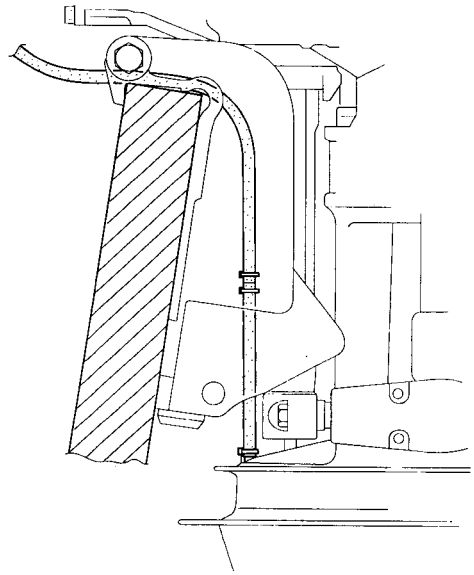
Route tube through swivel bracket as shown.

Secure tube to boat hull in such a way that the tube cannot be cut, bent or crushed. Then route the tube to the speedometer.

If sensor opening is plugged with salt or a foreign object, remove it with a piece of wire, etc.

When the boat is stored, remove the water in the sensor tube.

Before final tube attachment, make sure tube is not pulled too tight or crushed when motor is tilted UP or DOWN or turned full left or full right.



METER WIRE CONNECTIONS

Route and connect wire harness properly, as shown in the wiring diagram.

Use Meter Wire Harness A and B for meters.

Connect leads and terminals securely. Make sure terminals are waterproof.

Use 19-gauge (1.25 mm diameter) wires.

Connect the wire harnesses securely. If a terminal is oxidized or corroded, remove the oxidation or corrosion with a nonconductive plastic scrub pad or contact cleaner before reconnecting it.

Make sure insulators surround their connectors completely and that the ends are not folded up.

Do not break the wire harness coverings. If the covering of a wire is broken, either repair it with electrician's tape, or replace it.

Attach unused terminals to the adjacent main harness with a piece of vinyl tape so that the terminals don't interfere with the surrounding parts.

Connect each wire properly, as shown in the wiring diagram.

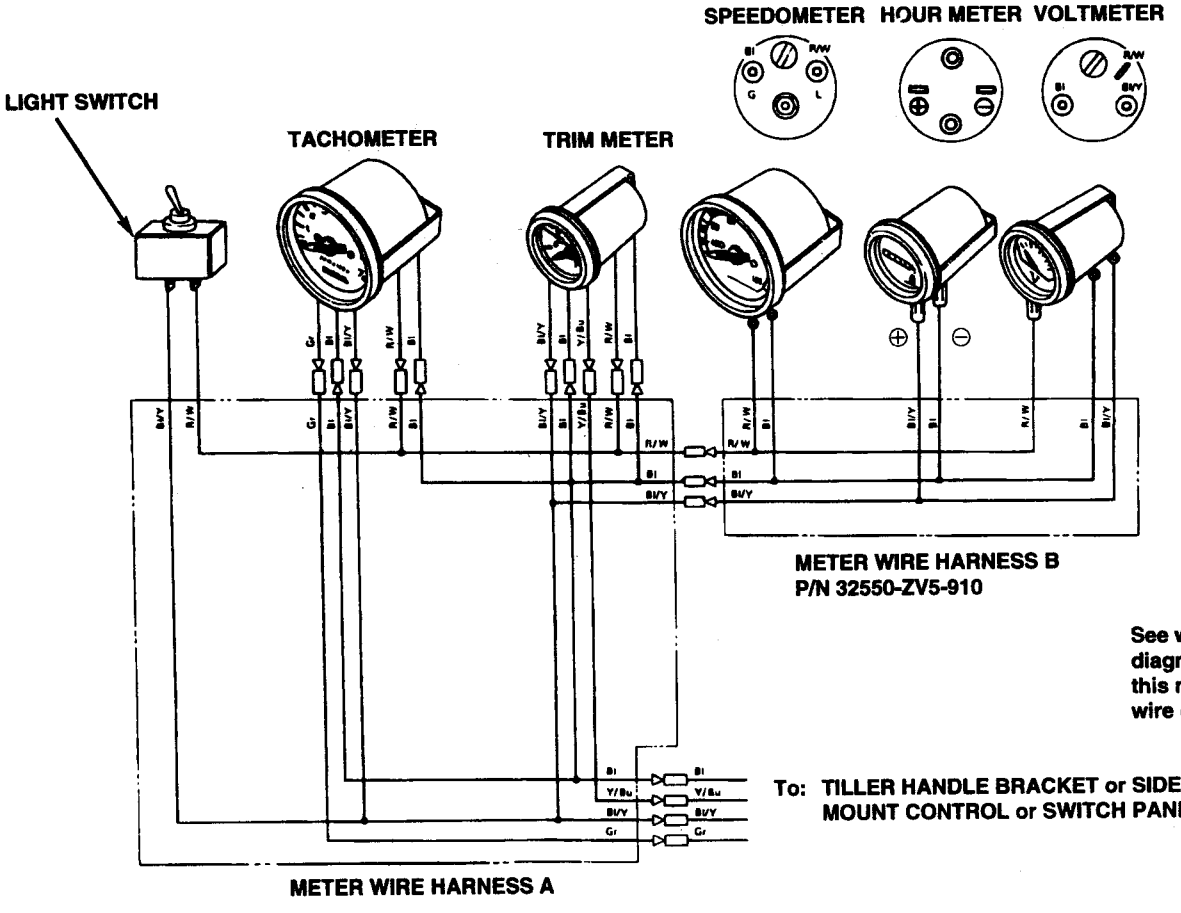
After each wire and harness is connected, check for proper connections by referring to the wiring diagram. Connect the battery and turn the main power on to check for proper operation.

Meter Wiring Diagram

This is an independent engine-control system. Do not attempt to integrate it with the boat's system or other accessories, except for the instrument light switch.

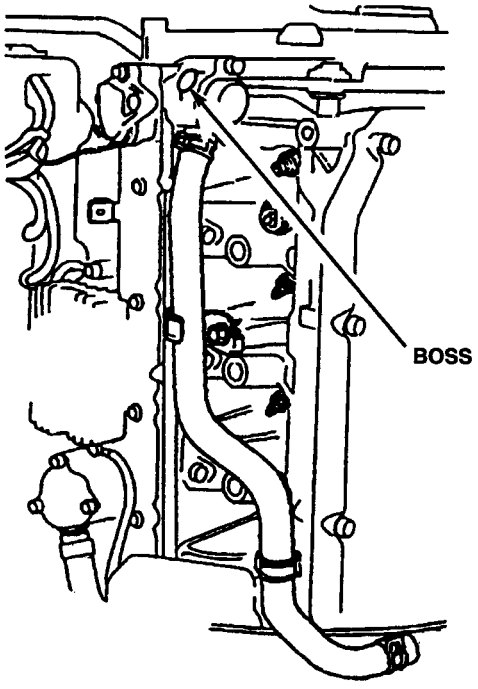
There are three ways to illuminate the instrument lights:

- Connect a commercially available switch (Teleflex 1A 16970 or equivalent) between the Bl/Y and R/W terminals.
- Connect 12V+ from the boat's instrument lights to the R/W terminal.
- Connect the Bl/Y and R/W terminals together for "lights on" with the engine switch.



WATER PRESSURE GAUGE

A hole can be drilled and tapped on the flush valve spacer boss for installing a hose barb fitting.



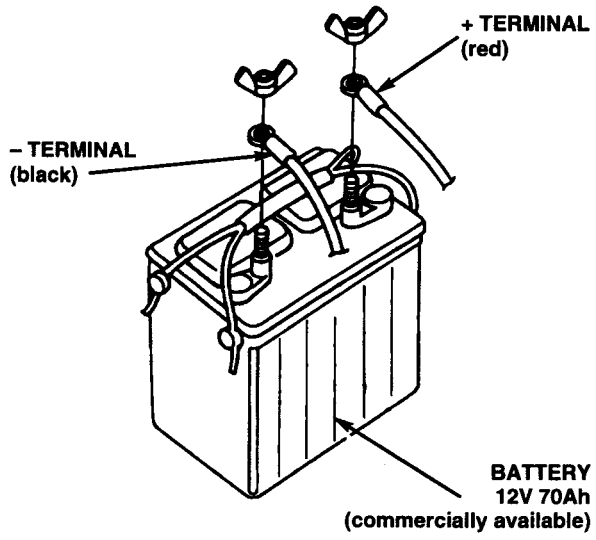
Follow shop manual instructions to remove spacer for drilling and tapping. Use fittings recommended by pressure gauge manufacturer.

BATTERY (not included)

Minimum requirements:
12V-70 Ah marine cranking battery

If boat is equipped with two outboard motors, two batteries must be installed, one for each motor.

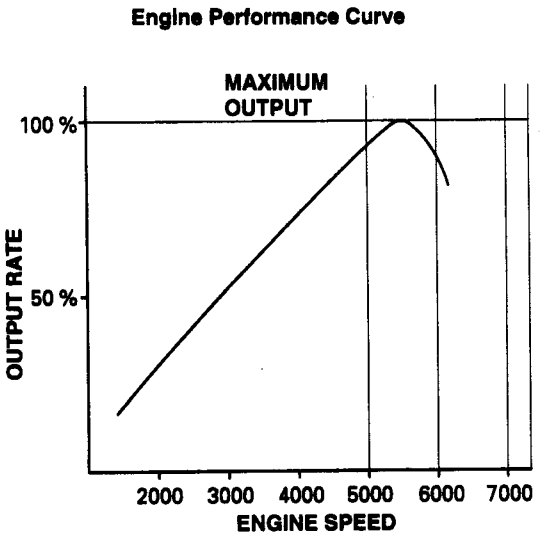
In the event that a battery failure makes it necessary to temporarily use one battery for two motors, disconnect the ground wire from between the two switch panels.

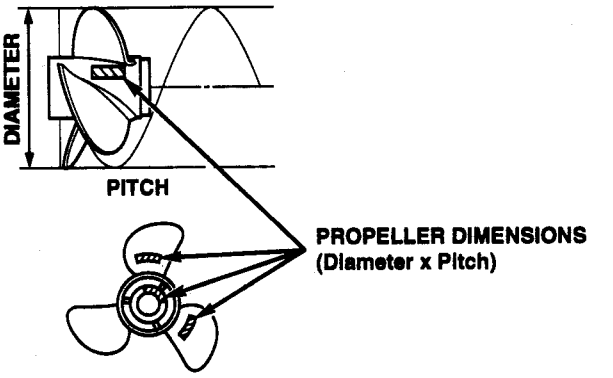


1. Install the battery in the correct size corrosion-resistant battery box, in a dry, well-ventilated location protected from water and direct sunlight.
2. Connect the positive (+) battery cable first, then connect the negative (–) battery cable. Tighten cable nuts securely.
3. Coat battery terminal ends with nonconductive grease. Cover battery + terminal.
4. Secure the corrosion-resistant battery box properly to the boat. To keep potential sparks away from the fuel tank, do not secure or place battery near fuel tank.

PROPELLER

Propeller Selection





Pitch-Advanced Distance During One Turn (Apparent Advanced Distance)

Pitch Ratio $\frac{P}{D}$ **P: Pitch (mm)**
D: Outer Diameter of Propeller

Slip Ratio $\frac{\text{(Visual Advanced Distance - Measured Distance)}}{\text{Visual Advanced Distance}} \times 100$

During running; the actual advanced distance is reduced by about 10 ~ 15% due to propeller display pitch.

Recommended engine speed range: 5000 ~ 6000 rpm

Engine speed varies with propeller size and boat condition.
A propeller must be selected to adjust maximum engine speed to the recommended engine speed range.
Using the wrong propeller can cause motor damage. The proper propeller will assure powerful acceleration, top speed, good fuel economy, cruising comfort, and longer engine service life.

Propeller Selection Precautions

- Outboard motor must be installed vertically in relation to boat bottom. Set moderate trim angle, and adjust power trim angle to lowest setting.
- Set trim tab, so boat will run in a straight line.
- Protect propeller from foreign objects, check regularly for damage and/or deformation, and aquatic plants wrapped around propeller hub.
- Keep boat bottom clean of shells, algae growth and dirt. These will cause a significant drop in top speed.
- When doing propeller checks, select a calm day with little wave action.
- Avoid strong winds. Wind speed should be less than 10 miles/h (15 km/h).
- The boat should carry its average load (crew, load arrangement, ballast).

Select the correct propeller, so that full throttle engine speed is with the recommended range.

- If engine rpm is under the recommended rpm range, lower propeller pitch by 1 ~ 2 inches or more as needed.
- If engine rpm is over the recommended rpm range, select a propeller with a pitch one size larger or as needed.
- If the following conditions exist, acceleration will improve and outboard motor service life will increase by lowering the propeller pitch.
  - Heavy loads such as crew, load, equipment, water skiing, etc;
  - High temperatures and high humidity conditions;
  - When operating at high altitudes;
  - When boat bottom needs cleaning;
  - When area around gear case is obstructed;

To increase motor service life and ensure safe navigation, do not use full throttle for extended periods, but run motor at 70 ~ 80% of full throttle.

NOTICE

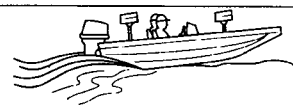
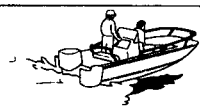
If full throttle engine rpm exceeds the recommended range, it can cause increased vibration, noise, reduced boat performance, and possible engine wear damage.

If full throttle engine rpm is below recommended range, it indicates that the engine is being overloaded.

Aluminum Propeller Selection Chart

Outboard motor	Propeller size Dia. × pitch (in)	Thrust in recommended rpm (kgf)	Speed within recommended engine speed (km/h) 0 10 20 30 40 50 60 70 80 90
BF90A	14 × 11	680-750	I 0-10.0
	14 × 13	608-738	I 0-20.0
	13-3/4 × 15	461-650	E 2.5-36.0
	13-1/4 × 17	355-538	E 14.9-47.9
	13 × 19	244-428	H, C, D, B, F, G 29.4-62.0
	12-3/4 × 21	146-321	C, D, B, F, H, G 43.0-76.9
	12-1/4 × 23	63-192	59.5-93.5 G, A
BF75A	14 × 11	629-694	I 0-10.0
	14 × 13	441-655	I 0-20.2
	13-3/4 × 15	320-543	E 2.5-36.3
	13-1/4 × 17	236-443	E 14.9-47.9
	13 × 19	146-341	B, H, D, F, C 29.4-62.0
	12-3/4 × 21	173-241	F, H, G 43.0-76.9
	12-1/4 × 23	22-134	59.5-93.5 G, A

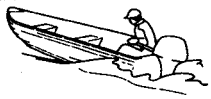
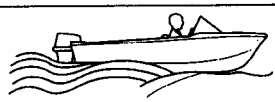
Boat type and appliable size (length, weight)

Code	Boat type	Overall length (ft)	Weight (kg)	Hull shape (Example)
A	Bass boat	15-18	650-800	
B	Center console	16-18	900-1250	

Stainless Steel Propeller Selection Chart

Outboard motor	Propeller size Dia. × pitch (in)	Thrust in recommended rpm (kgf)	Speed within recommended engine speed (km/h) 0 10 20 30 40 50 60 70 80 90
BF90A	13-1/8 × 16	355-538	E 11.7-44.7
	13 × 18	244-428	D, B, H, F 26.2-58.8
	13-1/4 × 20	146-321	G, C, D, B, F, H 39.8-73.7
	13-1/2 × 22	63-192	56.3-90.3 G, A
BF75A	13-1/8 × 16	355-538	E 14.9-47.9
	13 × 18	244-428	D, B, F, C, H 29.4-62.0
	13-1/4 × 20	146-321	F, H, G 43.0-76.9
	13-1/2 × 22	63-192	59.5-93.5 G, A

Boat type and appliable size (length, weight)

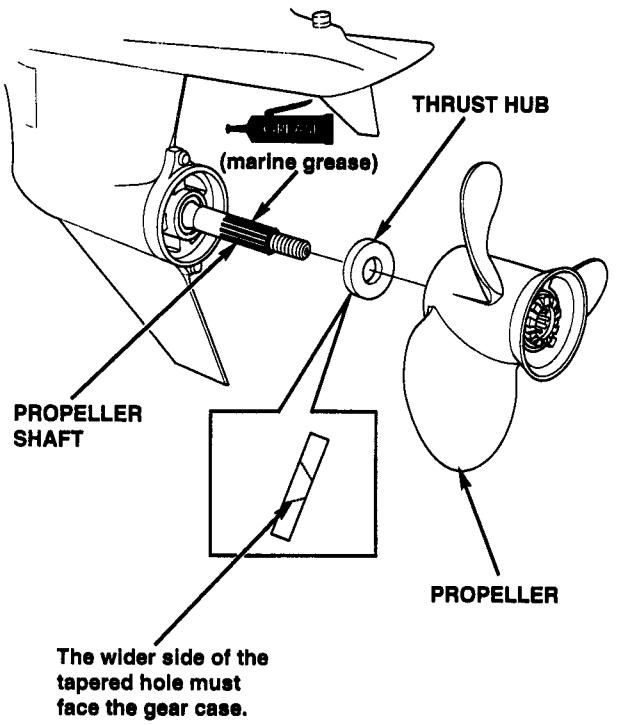
Code	Boat type	Overall length (ft)	Weight (kg)	Hull shape (Example)
C	Fishing boat	15-17	850-1000	
D	Inflatable	17-19	550-750	
E	Pontoon boat	18-32	1500-2500	
F	Runabout	15-18	800-1200	
G	Water ski	15-16	800-900	
H	Utility	16-21	800-1200	
I	Working boat		2000-	

Propeller Installation

Disconnect the spark plug caps to prevent the engine from starting accidentally.

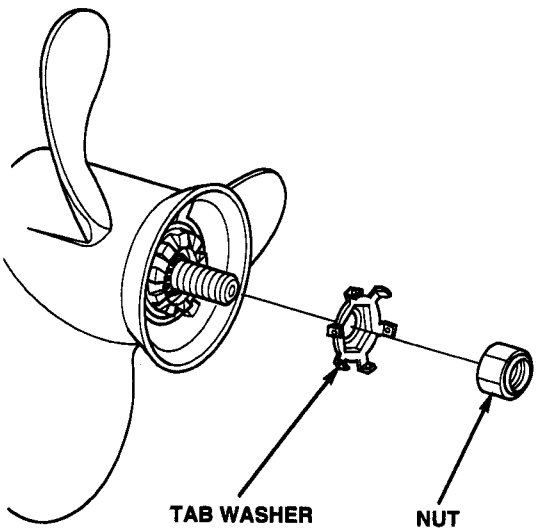
Wear heavy gloves to protect your hands from sharp or nicked propeller blades.

1. Apply marine grease to the propeller shaft.
2. Install thrust hub and propeller on propeller shaft.



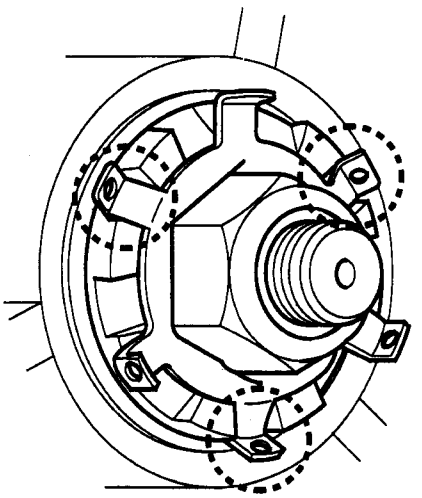
3. Install the tab washer and the lock nut. Tighten the lock nut together with the washer.

   TORQUE:
   Propeller nut: 55 ft-lb (75 N•m)



4. Align the three tabs of the tab washer with the propeller grooves, and bend the tabs to stake the lock nut.

   If the three tabs do not align with the grooves, tighten the nut a little more to obtain alignment.



ADJUSTMENT AFTER INSTALLATION

Trim Angle Adjustment

To get maximum performance in most applications, the transom angle adjusting rod should be positioned in the lowest hole.

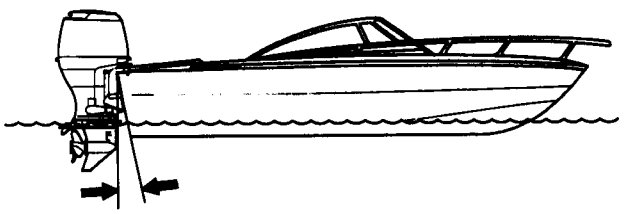
It may be necessary to move the adjusting rod to a higher position due to the following situations:

- To avoid interference when motor is trimmed to lowest position.
- If, due to boat weight or design, boat does not produce increased performance with motor trimmed to lowest hole.

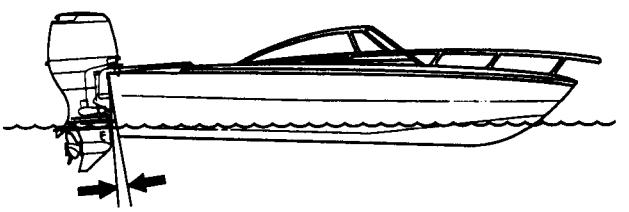
Motor installation angle (trim angle) can be adjusted when stopped or while running. Changing trim angle compensates for wave conditions, wind, boat load, crew number, etc., to ensure optimum handling.

Cruising Characteristics

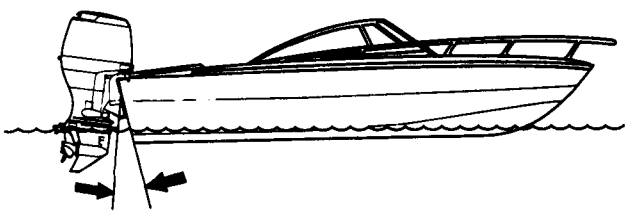
Proper trim angle:
Assures most stable cruising and maximum performance.



Excessive negative trim angle:
Causes unwanted "bow steer".

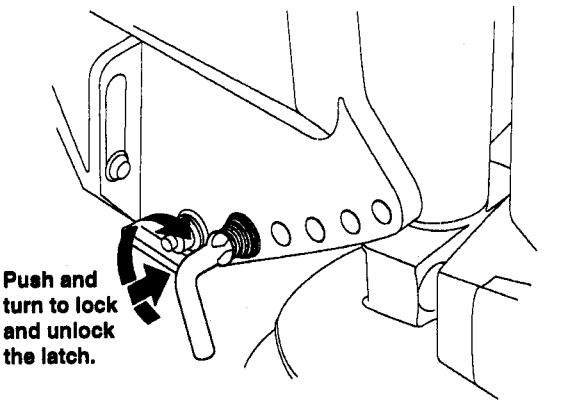


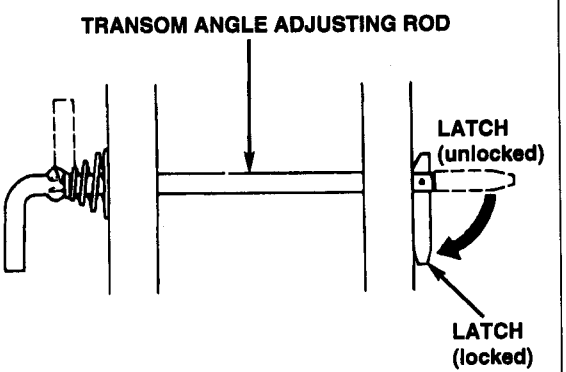
Too large trim angle:
Causes bow rise, which hinders stable cruising and planing.



Transom Angle Adjusting Rod Removal/Installation

1. Push in the transom angle adjusting rod, then twist upward and pull out to remove.
2. Turn the rod down and so the latch falls to the locked position.





Angle Adjustments:
5 Stages (8°, 12°, 16°, 20° and 24°)

The latch must be at a 90° angle to the rod.

After installation, make sure that the rod cannot come out, even if pulled.

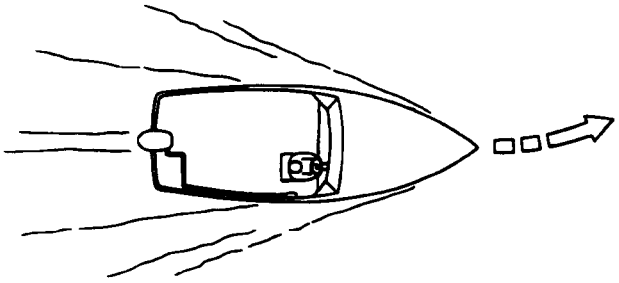
NOTICE

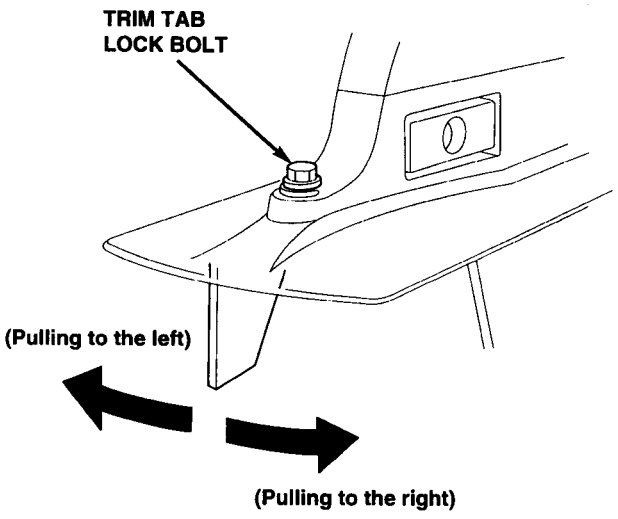
Do not operate the boat without the transom angle adjusting rod installed. Operating the boat without the transom angle adjusting rod installed can result in damage to the power trim/tilt unit.

TRIM TAB ADJUSTMENT

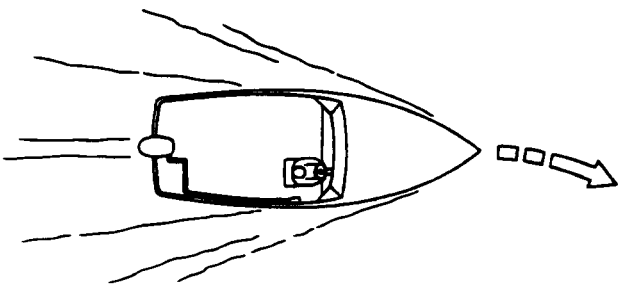
After engine break-in, run boat at full speed, and check to see if boat pulls to the left or right. Adjust trim tab as required, to ensure good, straight running characteristics.

If boat pulls to the left:
Loosen trim tab lock bolt, and move trim tab trailing edge to the left.





If boat pulls to the right:
Loosen trim tab lock bolt, and move trim tab trailing edge to the right.



BREAK-IN PROCEDURE

Break-in period: 10 hours

Break-in operation allows the moving parts to wear-in evenly and thus ensures proper performance and longer outboard motor service life.

First 15 minutes:
Run the outboard motor at trolling speed. Use the minimum amount of throttle opening necessary to operate the boat at a safe trolling speed.

Next 45 minutes:
Run the outboard motor up to a maximum of 2,000 to 3,000 rpm or 10% to 30% throttle opening.

Next 60 minutes:
Run the outboard motor up to a maximum of 4,000 to 5,000 rpm or 50% to 80% throttle opening. Short bursts of full throttle are acceptable but do not operate the motor continuously at full throttle.

Next 8 hours:
Avoid continuous full throttle operation (100% throttle opening). Do not run the outboard motor at full throttle for more than **5** minutes at a time.

For boats that plane easily, bring the boat up on plane, then reduce the throttle opening to the specified break-in settings called out above.

PRE-DELIVERY SERVICE CHECK LIST

Check all items on the following list. Refer to the Owner's Manual or Shop Manual for specifications and detailed procedures. Test every unit to be sure it is functioning properly.

ON LAND

☐ After completing the Pre-Delivery Service and Operation check lists, fill out the HONDA MARINE - Delivery Check List (#TM023). Give the yellow copy to the customer.

- **EXTERNAL APPEARANCE**

☐ Check for paint scratches; touch up if necessary.

- **INSTALLATION LOCATION**

☐ Check for correct installation location.

☐ Check outboard motor for correct installation height.

☐ Make sure the motor mounting bolts are tight.

☐ Check to be sure sealant has been applied to the transom mounting bolt holes.

- **GEAR OIL**

☐ Check for proper gear oil level. Make sure the oil level and drain plugs are tight.
OIL CAPACITY: 0.71 US qt. (0.66 ℓ)
Use Quicksilver Gearlube or Quicksilver Super-Duty Lower Unit Lubricant.
Honda P/N 92-19007A12 H/C 4918363

- **FUEL SYSTEM**

☐ Be sure fuel lines are connected securely.

☐ Make sure the fuel tank is full of fresh gasoline.

☐ Check for fuel leaks. If necessary, repair immediately.

- **STEERING SYSTEM**

☐ Check the steering system for smooth operation.

☐ Remote Control Types:
Make sure the outboard motor does not interfere with the steering cable and/or link arm, control cables, wire harness etc., when the steering wheel is turned full left and full right and with the motor in all tilt positions.

- **REMOTE CONTROL SYSTEM**

☐ Check remote control for proper operation.

☐ Make sure the control lever selects forward, neutral, and reverse gears.

☐ Check for full throttle capability.

☐ Check to be sure the throttle linkage operates smoothly with the remote control lever or gear shift lever at full throttle position. On side-surface mount controls, the choke/fast idle lever must be in the idle position.

☐ Make sure choke mechanism operates properly.

- **TILLER HANDLE CONTROL SYSTEM**

☐ Check the tiller handle for proper operation.

☐ Make sure that the gearshift lever selects forward, neutral, and reverse gears.

☐ Check that the throttle linkage operates smoothly with the throttle grip at full throttle position.

☐ Make sure choke mechanism operates properly.

☐ Adjust steering friction by turning friction adjuster.

- **ELECTRICAL SYSTEM**

☐ Check wire harness for proper connections.

☐ Check battery connections for correct polarity and tightness.

☐ Make sure battery is fully charged and installed securely.

☐ Make sure meters and switches are connected correctly.

- **TILT MECHANISM**

☐ Push power trim/tilt switch, and make sure outboard motor tilts up and down smoothly.

☐ Check for tilt motor noise while tilting up or down.

☐ Operate the steering with the outboard motor in the tilt UP position, and check to be sure that the cables, harnesses, boat splashwell, etc. do not interfere with the outboard motor.

☐ Tilt up outboard motor to full tilt up positon, check the power tilt oil level.

☐ Check manual tilt valve function.

☐ Make sure tilt stopper will set in the lock position at full tilt up position.

- **ENGINE OIL**

☐ Check engine oil level.
Engine Oil Capacity:
4.2 US qt. (4 ℓ) When oil filter is not replaced
4.7 US qt. (4.5 ℓ) When oil filter is replaced
Recommended Oil: SAE 10W-30
Use 4-stroke motor oil that meets or exceeds the requirement for API Service Classification SJ.
Always check the API SERVICE label on the oil container to be sure it includes the letters SJ.

- **ALL NUTS, BOLTS, & OTHER FASTENERS**

☐ Check security and tighten if necessary.

OPERATION CHECK LIST

IN THE WATER

- **OUTBOARD MOTOR INSTALLATION**

☐ Check that there are no water leaks from the motor mounting bolt holes.

☐ Check for balanced weight distribution in the boat.

- **OUTBOARD MOTOR OPERATION**

☐ Check choke for proper operation.

☐ Check neutral switch for proper operation.

☐ Turn the ignition switch to START, make sure the outboard motor starts.

☐ Check outboard motor for any abnormal noise.

☐ Check to be sure cooling water flows out of the cooling system indicator.
After the engine warms up:

- ☐ Make sure motor returns smoothly to idle.
- ☐ Check idle speed
  Idle Speed : 900 ± 50 rpm (in neutral)
- ☐ Snap throttle and check engine response.

☐ Check the emergency engine stop switch for proper operation.

- **LEAKS**

☐ Make sure that there are no leaks from the fuel lines and/or connections. If necessary, repair immediately.

☐ Check the outboard motor for water/oil leaks. Repair if necessary.

☐ Check exhaust system for gas leaks.

DURING SEA TRIALS

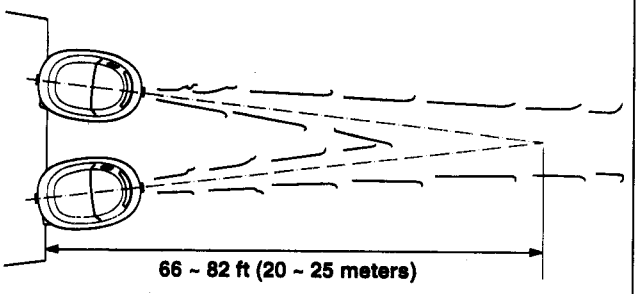
- **OUTBOARD MOTOR OPERATION**

☐ Check the gearshift operation with the remote control or gearshift lever.

☐ Check motor operation at trolling speed. Use the minimum amount of throttle opening necessary to operate the boat at a safe trolling speed for 15 minutes.

☐ Dual Motors:
Adjust tie bar length so the motors toe-out. Toe-out is when the motors' forward measurement is wider than the motors' aft measurement.

Motors with toe-out (viewed from the stern) will ensure better boat stability. It is best if the wakes of two motors join 66 ~ 82 ft (20 ~ 25 meters) astern.



Not all boats will follow this specification. Consult your boat manufacturer for toe-in or toe-out recommendation.

- **PROPELLER SELECTION**

☐ Check the engine rpm with the boat under way. Before engine break-in, avoid continuous full throttle operation (100% throttle opening). Do not run the outboard motor at full throttle for more than **2** minutes at a time.

MAXIMUM RECOMMENDED ENGINE RPM
5000 ~ 6000 rpm

☐ Make sure that there is no propeller ventilation in a straight line. There is the possibility of some propeller ventilation when turning at full throttle with the motor trimmed out.

AFTER SEA TRIALS

- **CHECK & CLEAN THE OUTBOARD MOTOR**

☐ Check that there is no water in the gear oil.

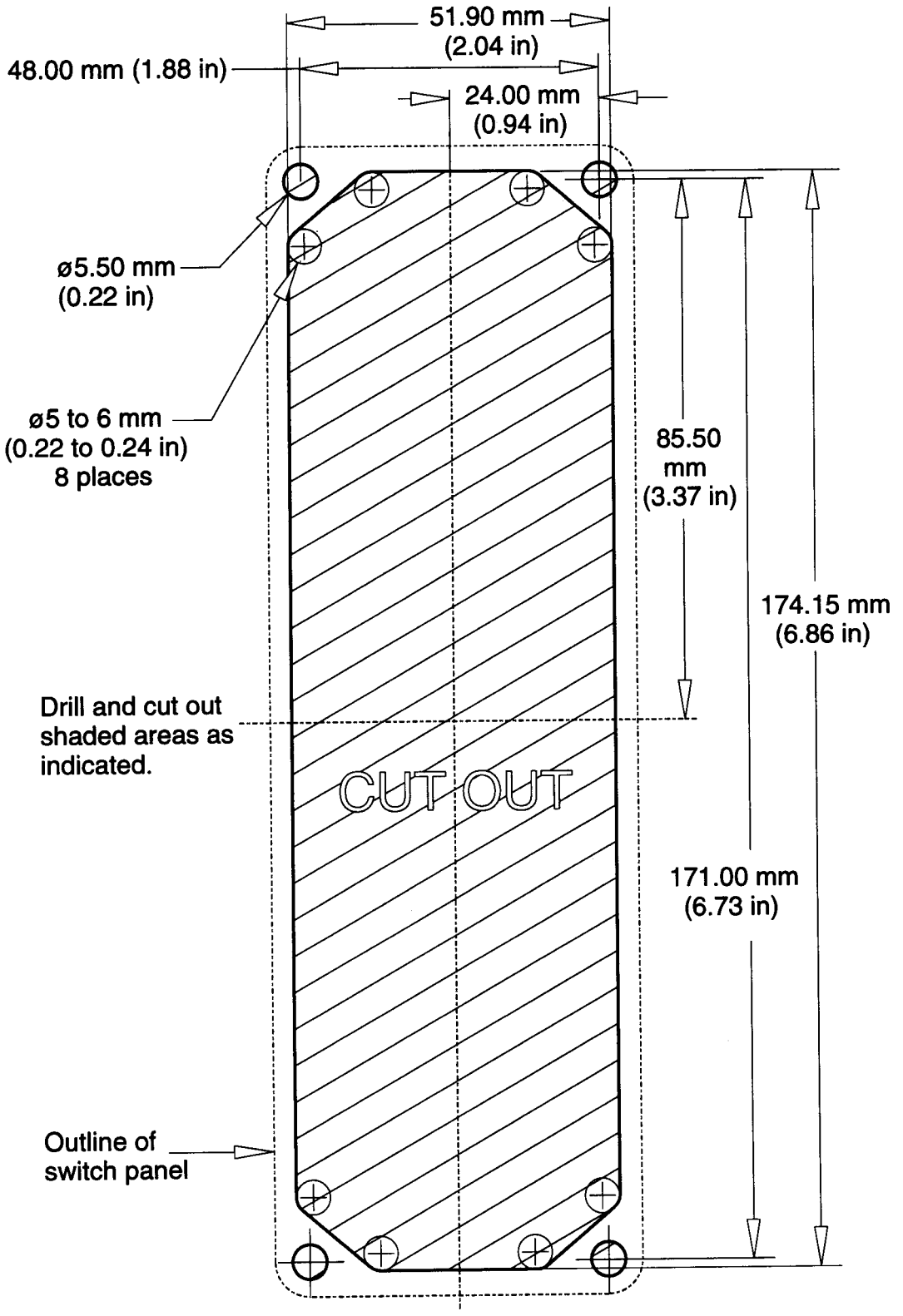
☐ Check that there are no signs of fuel, oil or water leaks. Repair if necessary.

☐ After running in salty or dirty water, use a flushing kit to flush the cooling system with clean water. Run the outboard motor at idle during flushing for approximately 10 minutes.

☐ Clean the entire outboard motor thoroughly with a cloth.

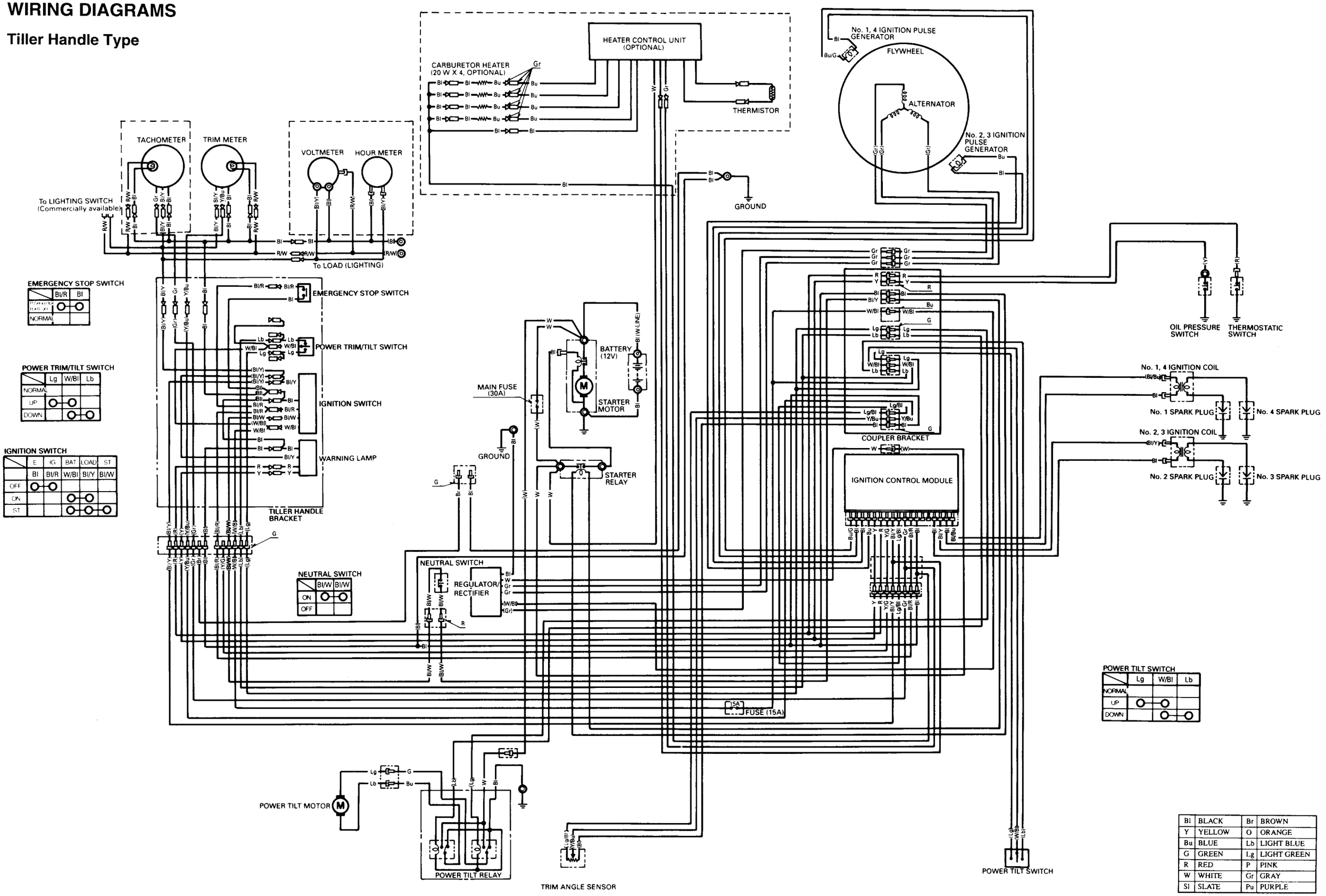
☐ Check the outboard motor for external damage, defects, or cracks.

SWITCH PANEL TEMPLATE



WIRING DIAGRAMS

Tiller Handle Type



EMERGENCY STOP SWITCH

	Bl/R	Bl
NORMAL		

POWER TRIM/TILT SWITCH

	Lg	W/Bl	Lb
NORMAL			
UP			
DOWN			

IGNITION SWITCH

	E	IG	BAT	LOAD	ST
	Bl	Bl/R	W/Bl	Bl/Y	Bl/W
OFF					
ON					
ST					

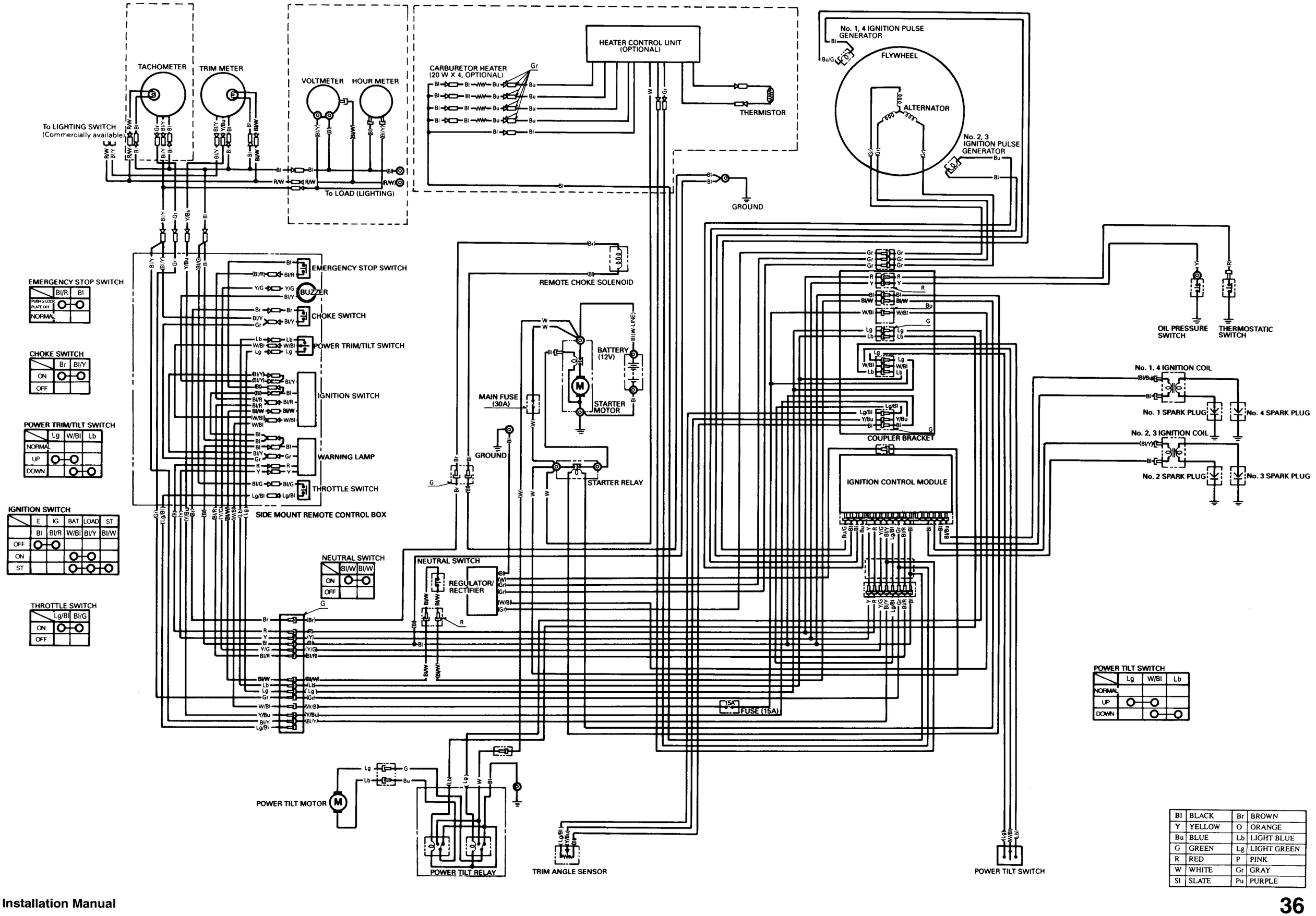
NEUTRAL SWITCH

	Bl/W	Bl/W
ON		
OFF		

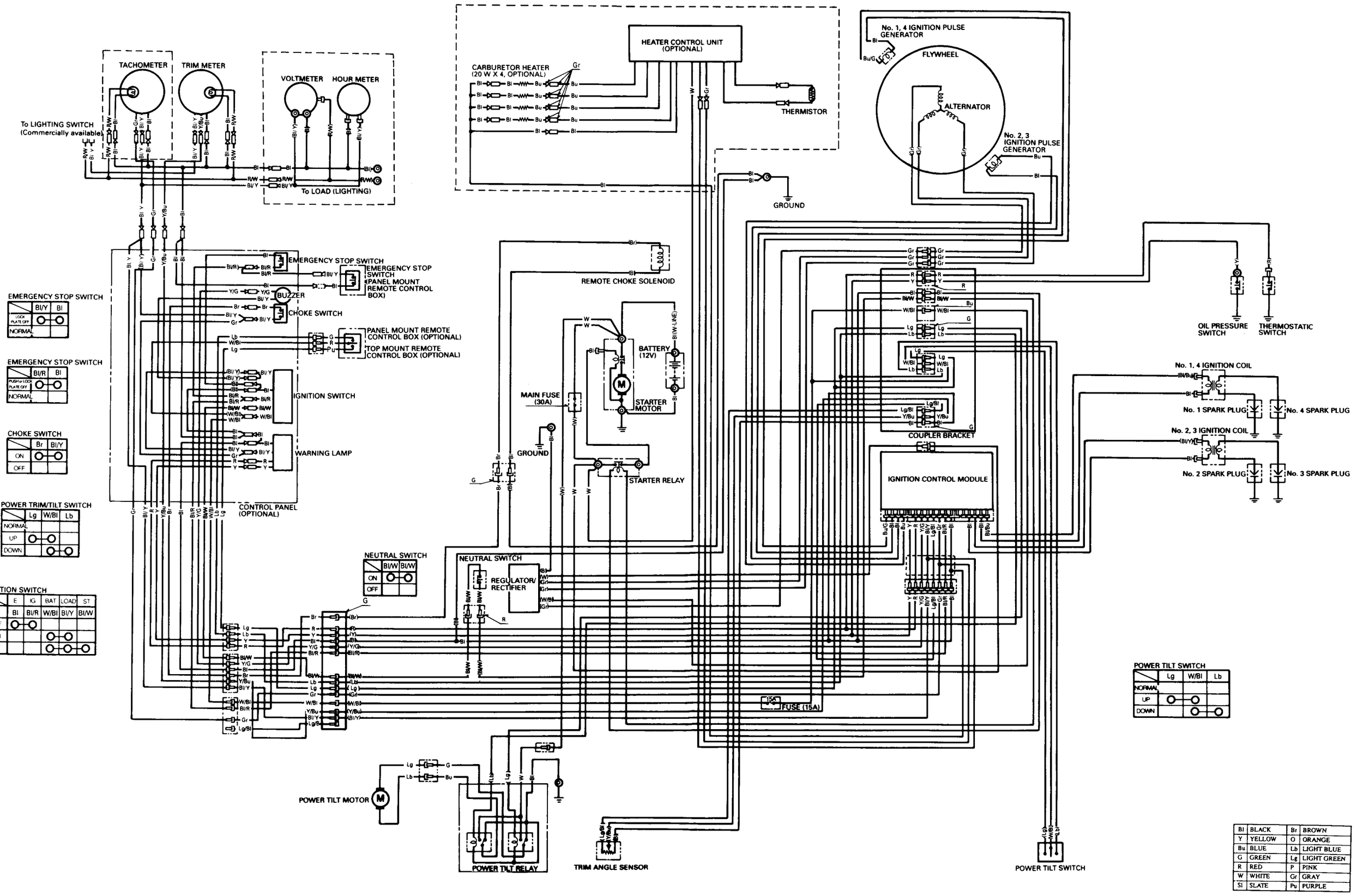
POWER TILT SWITCH

	Lg	W/Bl	Lb
NORMAL			
UP			
DOWN			

Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY
Sl	SLATE	Pu	PURPLE



Bl	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY
Sl	SLATE	Pu	PURPLE



	BI/Y	BI
LOCK PLATE OFF		
NORMAL		

	BI/R	BI
PUSH or LOCK PLATE OFF		
NORMAL		

	Br	BI/Y
ON		
OFF		

	Lg	W/BI	Lb
NORMAL			
UP			
DOWN			

	E	IG	BAT	LOAD	ST
	BI	BI/R	W/BI	BI/Y	BI/W
OFF					
ON					
ST					

	Lg	W/BI	Lb
NORMAL			
UP			
DOWN			

BI	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY
Sl	SLATE	Pu	PURPLE

IMPORTANCE OF PROPER SET-UP AND PRE-DELIVERY SERVICE

For Your Customer's Safety

Proper service and maintenance are essential to the customer's safety and the reliability of the engine. Any error or oversight while servicing an engine can result in faulty operation, damage to the engine, or injury to others.

⚠ WARNING

Improper set-up or pre-delivery service can cause an unsafe condition that can cause your customer to be seriously hurt or killed.

Follow the procedures and precautions in this manual and the shop manual carefully.

For Your Safety

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing set-up and pre-delivery service. Only you can decide whether or not you should perform a given task.

⚠ WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.

Follow the procedures and precautions in this manual carefully.

IMPORTANT SAFETY PRECAUTIONS

- Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any set-up or pre-delivery service, be especially careful of the following:
  - ☐ Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
  - ☐ Protect your eyes by using proper safety glasses, goggles, or face shields any time you hammer, drill, grind, or work around pressurized air or liquids, and springs or other stored-energy components. If there is any doubt, put on eye protection.
  - ☐ Use other protective wear when necessary, for example, gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
- Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:
  - ☐ Carbon monoxide poisoning from engine exhaust.
    Be sure there is adequate ventilation whenever you run the engine.
  - ☐ Burns from hot parts.
    Let the engine and exhaust system cool before working in those areas.
  - ☐ Injury from moving parts.
    If the instruction tells you to run the engine, be sure your hands, fingers, and clothing are out of the way.
- Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline.
  - ☐ Use only a nonflammable solvent, not gasoline, to clean parts.
  - ☐ Never drain or store gasoline in an open container.
  - ☐ Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.